REGISTER

OF

THE LEHIGH UNIVERSITY.

1883—1884.

TUITION FREE.

BETHLEHEM, PA.:
E. G. KLOSÈ, MANAGER.
1884.

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OF

THE LEHIGH UNIVERSITY,

SOUTH BETHLEHEM, PA.,

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FOUNDED BY ASA PACKER.

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BETHLEHEM, PA.:
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1884.

1884.	*Sunday.*	*Monday.*	*Tuesday.*	*Wednesday*	*Thursday.*	*Friday.*	*Saturday.*	1884.	*Sunday.*	*Monday.*	*Tuesday.*	*Wednesday*	*Thursday.*	*Friday*	*Saturday.*
JAN.	...	...	1	2	3	4	5	JULY	...	...	1	2	3	4	5
	6	7	8	9	10	11	12		6	7	8	9	10	11	12
	13	14	15	16	17	18	19		13	14	15	16	17	18	19
	20	21	22	23	24	25	26		20	21	22	23	24	25	26
	27	28	29	30	31	...	...		27	28	29	30	31	...	...
FEB.	...	...	...	...	...	1	2	AUG.	...	...	...	...	...	1	2
	3	4	5	6	7	8	9		3	4	5	6	7	8	9
	10	11	12	13	14	15	16		10	11	12	13	14	15	16
	17	18	19	20	21	22	23		17	18	19	20	21	22	23
	24	25	26	27	28	29	...		24	25	26	27	28	29	30
MAR.	...	...	...	...	...	...	1		31	...	...	...	...	...	...
	2	3	4	5	6	7	8	SEPT.	...	1	2	3	4	5	6
	9	10	11	12	13	14	15		7	8	9	10	11	12	13
	16	17	18	19	20	21	22		14	15	16	17	18	19	20
	23	24	25	26	27	28	29		21	22	23	24	25	26	27
	30	31	...	...	...	...	...		28	29	30	...	...	...	...
APR.	...	...	1	2	3	4	5	OCT.	...	...	...	1	2	3	4
	6	7	8	9	10	11	12		5	6	7	8	9	10	11
	13	14	15	16	17	18	19		12	13	14	15	16	17	18
	20	21	22	23	24	25	26		19	20	21	22	23	24	25
	27	28	29	30	...	...	...		26	27	28	29	30	31	...
MAY.	...	...	...	...	1	2	3	NOV.	...	...	...	...	...	...	1
	4	5	6	7	8	9	10		2	3	4	5	6	7	8
	11	12	13	14	15	16	17		9	10	11	12	13	14	15
	18	19	20	21	22	23	24		16	17	18	19	20	21	22
	25	26	27	28	29	30	31		23	24	25	26	27	28	29
	...	...	...	...	...	...	...		30	...	...	...	...	...	...
JUNE	1	2	3	4	5	6	7	DEC.	...	1	2	3	4	5	6
	8	9	10	11	12	13	14		7	8	9	10	11	12	13
	15	16	17	18	19	20	21		14	15	16	17	18	19	20
	22	23	24	25	26	27	28		21	22	23	24	25	26	27
	29	30	...	...	...	...	...		28	29	30	31	...	...	...

CALENDAR.

1883-84.

1883.		
Sept. 3–5,	Monday, Tuesday and Wednesday,	Examinations for Admission.
Sept. 5,	Wednesday,	First Term begins.
Oct. 11,	Thursday,	Founder's Day.
Nov. 29,	Thursday,	Thanksgiving Day.
Dec. 19,	Wednesday,	First Term ends.
1884.		
Jan. 8–9,	Tuesday and Wednesday,	Examinations for Admission.
Jan. 9,	Wednesday,	Second Term begins.
Feb. 22,	Friday,	Washington's Birthday.
Feb. 27,	Wednesday,	Ash Wednesday.
April 10,	Thursday,	Easter Holidays begin.
April 15,	Tuesday,	Easter Holidays end at 8¼ A.M.
May 26,	Monday,	University Day Orations due.
May 28,	Wednesday,	Theses due.
May 28,	Wednesday,	Senior Examinations begin.
June 7,	Saturday,	Senior Examinations end.
June 9,	Monday,	Annual Examinations begin.
June 13,14,16,	Friday, Saturday, and Monday,	Examinations for Admission.
June 15,	Sunday,	Baccalaureate Sermon.
June 17,	Tuesday,	Class Day.
June 18,	Wednesday,	Alumni Day.
June 19,	Thursday,	University Day.

1884-85.

1884.		
Sept. 1–3,	Monday, Tuesday and Wednesday,	Examinations for Admission.
Sept. 3,	Wednesday,	First Term begins.
Oct. 9,	Thursday,	Founder's Day.
Nov. 27,	Thursday,	Thanksgiving Day.
Dec. 17,	Wednesday,	First Term ends.
1885.		
Jan. 6, 7,	Tuesday and Wednesday,	Examinations for Admission.
Jan. 7,	Wednesday,	Second Term begins.

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Richard Brodhead, M.E., Class 1870,	New York City.

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Elisha P. Wilbur, Esq.,
John Fritz, Esq.,
James I. Blakslee, Esq.

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Professor of Physics.

JAMES P. KIMBALL, PH.D., F.G.S.,
Professor of Economic Geology.

C. L. DOOLITTLE, C.E.,
Professor of Mathematics and Astronomy.

W. A. LAMBERTON, M.A.,
Professor of the Greek Language and Literature.

MANSFIELD MERRIMAN, C.E., PH.D.,
Professor of Civil Engineering.

S. RINGER, U.J.D.,
Professor of Modern Languages and Literatures and of History.

HENRY C. JOHNSON, M.A., LL.B.,
Professor of the Latin Language and Literature.

THE REV. FREDERIC M. BIRD, M.A.,
Chaplain and Professor of Psychology, Christian Evidences and Rhetoric.

✓ EDWARD H. WILLIAMS, Jr., B.A., E.M., A.C.,
Professor of Mining Engineering and Geology.

JOSEPH F. KLEIN, D.E.,
Professor of Mechanical Engineering.

LECTURER.

W. L. ESTES, M.D.,
Lecturer on Physiology and Hygiene.

INSTRUCTORS.

SPENCER V. RICE, C.E.,
Instructor in Drawing.

A. E. MEAKER, C.E.,
Instructor in Mathematics.

LESTER P. BRECKENRIDGE, Ph.B.,
Instructor in Mechanical Engineering.

COURTNEY LANGDON,
Instructor in Modern Languages.

T. W. WRIGHT, M.A., C.E.,
Instructor in Civil Engineering.

JULIAN W. BAIRD, M.A., Ph.C.,
Instructor in Qualitative Analysis and Assaying.

ALBERT L. COLBY, Ph.B.,
Instructor in Quantitative Analysis.

RICHARD H. TUCKER, Jr., C.E.,
Instructor in Mathematics and Astronomy.

DIRECTOR OF THE GYMNASIUM.

WILLIAM H. HERRICK, B.A.

A. W. STERNER,
Chief Cataloguer of the Library.

AUG. H. LEIBERT,
Entry Clerk of the Library.

STUDENTS.

Clas.—Classical Course.
L. S.—Latin-Scientific Course.
Sci.—Course in Science and Letters.
Tech.—Technical Course.
C. E.—Civil Engineering.
E M.—Mining Engineering.
M. E.—Mechanical Engineering.
Met.—Metallurgy.
A. C.—Analytical Chemistry
Ad. Elec.—Advanced Electricity.

The students whose names are printed in *italics* are not clear of conditions.

GRADUATES.

	For Degree.	Residence.
Walter Briggs, B.A.,	M.A.,	Scranton.
Harry Augustus Butler, B.S.,	M.S.,	Mauch Chunk.
Hedley Vicars Cooke, B.A.,	M.A.,	Bethlehem.
Murray Morris Duncan, A.C., E.M.,	Ph.D.,	Chattanooga, Tenn.
Alfred Edmond Forstall, M.E.,	A.C.,	Chicago, Ill.
John Daniel Hoffman, B.A.,	M.A.,	Bethlehem.
Charles Comstock Hopkins, B.S.,	C.E.,	Woodhull, N. Y.
Garrett Linderman Hoppes, C.E.,	B.S.,	Bethlehem.
Preston Albert Lambert, B.A.,	M.A.,	Washington, D. C.
Wilson Franklin More, B.A.,	M.A.,	Lancaster.
Francis Henry Purnell, C.E.,	E.M.,	Berlin, Md.
Leonard Blakslee Treharn, B.A.,	M.A.,	Boston, Mass.
Luk Wing, Ph.B.,	E.M.,	Canton, China.

FIFTH YEAR STUDENTS.

	Course.	Residence.
Enos Kellar Bachman,	E.M.,	Pottstown.
George Francis Duck,	E.M.,	Englewood, N. J.
George Spencer Patterson,	E.M.,	Mahanoy City.
Henry Allebach Porterfield,	E.M.,	Emlenton.
Jesse Wilford Reno,	E.M.,	Boston, Mass.

SENIOR CLASS.

	Course.	Residence.
Elmer Ellsworth Brosius,	E.M.,	Lewistown.
Robert Grier Cooke,	Clas.,	Bethlehem.
Henry Bowman Douglas,	E.M.,	Fort Cameron, Utah.
John Roberts Engelbert,	C.E.,	Wiconisco.
William Banks Foote,	E.M.,	Rochester, N. Y.
Charles Owens Haines,	M.E.,	Savannah, Ga.
Harry Tallman Harper,	C.E.,	Wiconisco.
Harry Hurd Hillegass,	C.E.,	Reading.
Edwin Franklin Hofford,	C.E.,	Lehighton.
John Andrew Jardine,	E.M.,	McCainsville, N. J.
James Warner Kellogg,	M.E.,	Atchison, Kan.
David Garret Kerr,	E.M.,	Wilkinsburgh.
Frederick Bowman Langston, jr.,	C.E.,	Bethlehem.
William Langston,	C.E.,	Bethlehem.
Robert Packer Linderman,	L.S.,	South Bethlehem.
Joseph Franklin Merkle,	C.E.,	Cressona.
Harry Krider Myers,	C.E.,	Tyrone.
Albino Rosendo Nuncio,	M.E.,	Saltillo, Mexico.
James Ward Packard,	M.E.,	Warren, O.
Alfred Scull Reeves,	E.M.,	Phoenixville.
Barry Searle,	A.C.,	Montrose.
Lewis Buckley Semple,	Clas.,	Bethlehem.
Augustus Parker Smith,	M.E.,	Norwich, Conn.
Murray Stewart,	M.E.,	Reading.
Richard Washington Walker,	C.E.,	Barneston.
James Angus Watson,	C.E.,	Catonsville, Md.

JUNIOR CLASS.

	Course.	Residence.
Alton Dermont Adams,	Ad.Elec.,	Biddeford, Me.
Warren Howard Allen,	A.C.,	Athens.
Harrison Link Auchmuty,	C.E.,	Millersburg.
William Lowry Beverson,	C.E.,	York.
Theodore Weld Birney,	C.E.,	Washington, D. C.
Harry Luther Bowman,	E.M.,	Millersville.
William Harvey Cooke,	Clas.,	Bethlehem.
William Noble Edson,	C.E.,	Clifton Springs, N. Y.
Felix Freyhold,	C.E.,	Washington, D. C.
Irving Andrew Heikes,	E.M.,	Mechanicsburg.
Charles Alexander Junken,	C.E.,	Washington, D. C.
John Myron Kellogg,	Met.,	Liberty Corner.
Edward Morton McIlvaine,	A.C.,	Reading.
David Kirk Nicholson,	M.E.,	Jenkintown.
Fayette Brown Petersen,	C.E.,	Washington, D. C.
John Bertsch Price,	C.E.,	Upper Lehigh.
Byron Elmer Rhoads,	C.E.,	Lake.
Harry William Rowley,	M.E.,	South Bethlehem.
Elliot Otis Smith,	C.E.,	Maquoketa, Iowa.
George Washington Snyder,	C.E.,	Pottsville.
Robert Donald Stewart,	A.C.,	Lancaster.
Thomas Broomall Temple,	E.M.,	Lionville.
Charles Elihu Thomas,	C.E.,	Pottstown.
Clarence Moncure Tolman,	M.E.,	Washington, D. C.
John Wagner,	M.E.,	South Bethlehem.
James Hollis Wells,	M.E.,	Bethlehem.
Cabell Whitehead,	E.M.,	Amherst, Va.

SOPHOMORE CLASS.

	Course.	Residence.
Philip Albrecht,	A.C.,	New Orleans, La.
Francisco Alberto Bermudes,	E.M.,	Leon, Nicaragua.
George Rodney Booth,	L.S.,	Bethlehem.
Richard Singmaster Breinig,	E.M.,	Breinigsville.
John Henry Brown,	C.E.,	South Bethlehem.
Charles Ellsworth Clapp,	L.S.,	Warren, O.
George Henry Cobb,	E.M.,	Palmer, Mass.
Josè de Cueto,	M.E.,	Asturias, Spain.
William Henry Dean,	E.M.,	Clarence, Iowa.
Alfred Doolittle,	Clas.,	Bethlehem.
Frederick William Fink,	C.E.,	Summit Hill.
Harry William Frauenthal,	E.M.,	Wilkes-Barre.
Harry James Frear,	C.E.,	Factoryville.
Robert Caldwell Gotwald,	C.E.,	York.
Charles Graham, Jr.,	M.E.,	Kingston,
Lewis John Henry Grossart,	C.E.,	Allentown.
Max Sigmund Hanauer,	A.C.,	Lancaster.
Solomon Jacob Harwi,	C.E.,	Friedensville.
Lloyd Robinson Hawley,	C.E.,	Dixon, Ill.
George North Hayward,	C.E.,	Buffalo, N. Y.
Simeon Cole Hazleton,	E.M.,	Washington, D. C.
Mark Antony DeWolfe Howe, jr.,	Clas.,	Reading.
James Henry Jacobson,	E.M.,	Bethlehem.
Arthur Monroe Jaggard,	E.M.,	Altoona.
Harry Orlando Koller,	M.E.,	Reading.
Robert Thomas Lawther,	E.M.,	Wyoming.
* Garrett Brodhead Linderman, jr.,	L.S.,	South Bethlehem.
Charles Augustus Luckenbach,	E.M.,	Bethlehem.

* Excused.

	COURSE.	RESIDENCE.
Horace Andrew Luckenbach,	E.M.,	Bethlehem.
William Anthony Lydon,	E.M.,	Chicago, Ill.
Frank Paret Magee,	E.M.,	Groveland, N. Y.
Arnon Permin Miller,	A.C.,	South Bethlehem.
Paul Douglass Millholland,	C.E.,	Reading.
Robert Adam Nagle,	Clas.,	Lower Saucon.
Lucian Holley Norton,	E.M.,	Bridgeport, Conn.
Francis William Birchal Pile,	E.M.,	London, England.
Henry Gerber Reist,	M.E.,	Florin.
Edward E. Reynolds,	C.E.,	Pittston.
Joseph William Richards,	A.C.,	Philadelphia.
George Mann Richardson,	A.C.,	St. Louis, Mo.
Augustus Stoughton Ross,	M.E.,	Philadelphia.
George Arthur Ruddle,	L.S.,	Mauch Chunk.
William Heysham Sayre, jr.,	M.E.,	South Bethlehem.
Alexander Provost Shaw,	C.E.,	Washington, D. C.
John Selmar Siebert,	C.E.,	Washington, D. C.
John Bernard Simon, jr.,	C.E.,	Harrisburg.
Artherholt Smith,	E.M.,	Larimer.
Francis Timothy Smith,	C.E.,	Simsbury, Conn.
John Henry Spengler,	C.E.,	Bethlehem.
Edwin Stanton Stackhouse,	E.M.,	Shickshinny.
Edward Eckert Stetson,	A.C.,	Reading.
Theodore Stevens,	E.M.,	Philadelphia.
Harry Eugene Stout,	E.M.,	Audenried.
Joseph Kiddoo Surls,	E.M.,	Beaver Falls.
William Patterson Taylor,	Clas.,	Sharon Hill.
Thomas Thomas,	E.M.,	Pittston.
Harry Toulmin,	L.S.,	Bethlehem.
Priestly Toulmin,	E.M.,	Bethlehem.
Curtis Hussey Veeder,	M.E.,	Omaha, Neb.
Hugh Washington Wilson,	M.E.,	Washington.

FRESHMAN CLASS.

	COURSE.	RESIDENCE.
David Bast Abbott,	Tech.,	Bethlehem..
William David Blakslee Ainey,	L.S.,	New Milford.
Frank Fielding Amsden,	Tech.,	Scranton.
Gustav Ayres,	Tech.,	Washington, D. C.
George Hamilton Ayres,	Tech.,	Washington, D. C.
Robert Webb Barrell,	Tech.,	New Providence, N. J.
Charles Thomas Barnsley,	Tech.,	Hartsville.
William Edgar Bates,	Tech.,	Allentown.
Ebenezer Lincoln Bevan,	Tech.,	Pittston.
Herman Hoffman Birney,	L.S.,	Washington, D. C.
Thomas Graves Boggs,	Tech.,	Alleghany.
Alexander Bonnot,	Tech.,	Norfolk, Va.
William James Jarrard Bowman,	Tech.,	Trenton, N. J.
Harry Clark Bradford,	Tech.,	San Francisco, Cal.
William Bradford,	Tech.,	Dover, Del.
Joseph Gerald Branch,	Tech.,	Columbia, Tenn.
Cyrus Emory Brown,	Tech.,	Johnstown.
Kennerly Bryan,	Tech.,	Baltimore Md.
Denio Wetmore Buchanan,	Tech.,	Athens.
Charles Austin Buck,	Tech.,	South Bethlehem.
Julian Carter Buckner,	Tech.,	Baltimore, Md.
Otto Cornelius Burkhardt,	Tech.,	Bethlehem.
John Hershey Byerly,	Tech.,	Millersville.
Lansford Foster Chapman,	Tech.,	Catasauqua.
Edward Marsden Cooke,	Sci.,	Bethlehem.
Charles Belmont Davis,	Tech.,	Philadelphia.
Louis Loeser Dewees,	Sci.,	Pottsville.
Eugene Diven,	Clas.,	Elmira, N.Y.
Frank Rouad Dravo,	Tech.,	Allegheny.
Patrick F. Enright,	Tech.,	South Bethlehem.

	Course.	Residence.
Milton Henry Fehnel,	Sci.,	Bethlehem.
John Hammond Fertig,	Tech.,	Titusville.
Harvey Sheafe Fisher,	Clas.,	Pottsville.
John Douglas Forster,	Tech.,	Harrisburg.
Kenneth Frazier,	Clas.,	Bethlehem.
Charles William Frey,	Tech.,	Bethlehem.
Dennis Gallagher,	Tech.,	South Bethlehem.
Henry Stevens Haines, jr.,	Tech.,	Savannah, Ga.
Hughlett Hardcastle,	L.S.,	Easton, Md.
Clinton Alfred Harwi,	Tech.,	Bethlehem.
John Sax Hileman,	Sci.,	Pittston.
John Benjamin Franklin Hittell,	Tech.,	Allentown.
Edward Randolph Hix,	Tech.,	New York City.
John Myers Howard,	Tech.,	Hagerstown, Md.
William Frederic Kiesel, jr.,	Tech.,	Scranton.
Herbert Knight,	Tech.,	Lancaster.
Frederick Hayes Knorr,	Tech.,	Philadelphia.
George Herman Koehler,	Tech.,	Hunter's Point, N. Y.
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Samuel Davis Langdon,	Tech.,	Summerville, Ga.
Ralph William Lee,	Tech.,	Catonsville, Md.
Kwai Pahn Lee,	Tech.,	Canton, China.
Alfred Kramer Leuckel,	L.S.,	Lehighton.
James Struthers Mack,	Tech.,	Mauch Chunk.
William Longstreth Mack,	Tech.,	Mauch Chunk.
William Sprague Maharg,	Tech.,	Bethlehem.
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Mason Delano Pratt,	Tech.,	Carlisle.
Walter Rollin Rathbun,	Sci.,	South Bethlehem.
Albert George Rau,	Sci.,	Bethlehem.
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George Thomas Richards,	Tech.,	Pittsburgh.
George William Riegel,	Tech.,	Bethlehem.
Edward Benjamin Schmidt,	L.S.,	Ilion, N. Y.
John Warwick Scull,	Tech.,	Philadelphia.
Henry William Shurts,	Tech.,	Orange, N. J.
William Herman Slingluff,	Tech.,	Norristown.
Elmer Ellis Snyder,	Tech.,	Bethlehem.
Harry Harkness Stoek,	Tech.,	Washington, D. C.
Wyndam Harvey Stokes,	Tech.,	Germantown.
Walter Edgar Stott,	Tech.,	Washington, D. C.
Charles Edward Stout,	Sci.,	Bethlehem.
Miguel Rafael Suarez,	Tech.,	Sagua la Grande, Cuba.
Gilbert Beebe Taylor,	Tech.,	Smyrna, Del.
Otway Owen Terrell,	Tech.,	Burton's Creek, Va.
John William Thomas,	Tech.,	Hokendauqua.
Charles Prentice Turner,	Tech.,	Oxford, N. Y.

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Thomas Maben Wherry,	Tech.,	South Bend.
Robert Lee Whitehead,	Tech.,	Amherst, Va.
August Julius Wiechardt,	Tech.,	Philadelphia.
Harry Wilbur,	Tech.,	Bethlehem.
William Herman Wilhelm,	L.S.,	Mauch Chunk.
Henry August Julius Wilkens,	Tech.,	Baltimore, Md.
Frank Williams,	Tech.,	Johnstown.
Arthur Raymond Wilson.	Sci.,	Bethlehem.
Nissley Joseph Witmer,	Tech.,	Bismark.
Wade Hampton Woods,	Sci.,	Philadelphia.
Walter Wyckoff,	Tech.,	Belvidere, N. J.
Harry Clay Yeatman, jr.,	Tech.,	Columbia, Tenn.
George Frederic Yost,	Tech.,	Bethlehem.

SPECIAL STUDENTS.

Henry M. Byllesby,	M.E.,	New York City.
Albert Dana Davidson,	C.E..	Hamilton, Montana.
Richard Harding Davis,	L.S.,	Philadelphia.
James Ritchie Mitchell,	M.E.,	Aberdeen, Scotland.
Eben Miltimore Morgan,	A.C.,	Reading.
John Wesley Peale,	E.M.,	Lock Haven.
George Reginald Radford,	A.C.,	Washington, D. C.
Jacob Shotwell Robeson,	A.C.,	Philadelphia.
William James Brown Walker,	E.M.,	Mansfield.
James Gilbert White, B.A.,	E.M.,	Milroy.
Rollin Henry Wilbur,	L.S.,	South Bethlehem.
Daniel Stout Williams, jr.,	C.E.,	Cedar Creek, N. J.

SUMMARY OF STUDENTS.

Graduates,	13
Fifth Year Students,	5
Seniors,	26
Juniors,	27
Sophomores,	60
Freshmen,	106
Specials,	12
Total,	249

SUMMARY OF STUDENTS BY STATES.

Maine,	1
Massachusetts,	3
Connecticut,	3
New York,	11
Pennsylvania,	158
New Jersey,	8
Delaware,	2
Maryland,	10
District of Columbia,	16
Virginia,	4
Georgia,	4
Louisiana,	1
Ohio,	2
Illinois,	3
Michigan,	1
Wisconsin,	1
Iowa,	2
Missouri,	2
Tennessee,	4
Kansas,	1
Nebraska,	1

California,	1
Montana,	1
Utah,	1
England,	1
Scotland,	1
Spain,	1
China,	2
Mexico,	1
Nicaragua,	1
Cuba,	1
Total,	249

SUMMARY OF STUDENTS BY COURSES.

SCHOOL OF GENERAL LITERATURE.

Classical Course,	16	
Latin-Scientific Course,	15	
Course in Science and Letters,	13	
		44

SCHOOL OF TECHNOLOGY.

Course in Civil Engineering,	71	
Course in Mining Engineering,	62	
Course in Mechanical Engineering,	47	
Course in Analytical Chemistry,	24	
Course in Metallurgy,	1	
		205
Total,		249

THE LEHIGH UNIVERSITY.

ORIGIN.

The Hon. Asa Packer of Mauch Chunk, during the year 1865, appropriated the sum of Five Hundred Thousand Dollars, to which he added one hundred and fifteen acres of land in South Bethlehem, to establish an educational Institution in the rich and beautiful Valley of the Lehigh. From this foundation rose The Lehigh University, incorporated by the Legislature of Pennsylvania in 1866. In addition to these gifts, made during his lifetime, Judge Packer by his last will secured to the University an endowment of $1,500,000, and to the University Library one of $500,000.

DESIGN.

The original object of Judge Packer was to afford the young men of the Lehigh Valley a complete technical education for those professions which had developed the peculiar resources of the surrounding region. Instruction was to be liberally provided in Civil, Mechanical and Mining Engineering, Chemistry, Metallurgy, and in all needful collateral studies. French and German were made important elements in the collegiate course. A School of General Literature was part of the original plan, together with tuition in the ancient Classics.

FREE TUITION.

All these educational facilities are provided without charge. Through the generosity of the Founder, the Trustees were enabled, in 1871, to declare tuition free in all branches and classes. The Lehigh University is open to young men of good character and suitable preparation from every part of our own land and of the world.

To this fact the attention of the pupils of our public schools and of the graduates of classical institutions is especially called. Thus is offered *without charge*, every facility for studying the professions of the Civil, Mechanical and Mining Engineer, and of the Metallurgist and Analytical Chemist. In the Classical and Scientific departments of the School of General Literature instruction is given in the Classics, Science and Letters.

PUBLIC WORSHIP.

Prayers are held in the Chapel every morning and all students are required to be present.

Divine Service is held on every Sunday morning, according to the forms of the Protestant Episcopal Church, in the Chapel of the University. Attendance at this service is required of every student, except in case of those connected with other religious bodies, to whom the President will grant permission at the beginning of each term (if requested by the parent or guardian, or by the student himself if he be 21 years of age) to attend during that term the place of worship of the body with which he is connected, where attendance on Sunday morning will be required.

SITE.

The situation of the Institution is healthful and beautiful. The region is famous for its railway and manufacturing enterprises; it possesses some of the richest iron and coal mines in our land, and thus gives the students rare facilities for confirming the teachings of the recitation room by the observation of the eye.

The University Buildings are about a half-mile from the depot, at the junction of the Lehigh Valley and North Pennsylvania Railroads. New York is ninety-two, and Philadelphia fifty-four miles distant.

BUILDINGS.

PACKER HALL,

named after the Founder, stands seven hundred feet back of Packer Avenue, at the base of the South Mountain. It is built of stone and contains the Chapel, Lecture and Recitation rooms, the Drawing Room and the Cabinets.

THE UNIVERSITY LIBRARY.

To the east of Packer Hall stands the University Library, erected by the Founder in memory of Mrs. Lucy Packer Linderman, his daughter.

THE NEW GYMNASIUM,

completed last March, is a handsome and spacious structure, built and equipped with the utmost thoroughness. It is furnished with the best patterns of gymnastic apparatus, besides Dr. Sargent's system of Developing Appliances. It is provided with hot and cold water; tub, sponge, and shower baths, and 246 clothes closets. Opportunities for recreation and amusement are provided in the billiard room and bowling-alleys.

It is under the immediate care of a skilled and competent Director.

All students are required to undergo a physical examination before being allowed the use of the Gymnasium, and this examination will be repeated once each year during their stay at the University. The aim of the Institution is to promote a harmonious symmetrical development best suited to the individual condition of the student.

THE SAYRE OBSERVATORY.

Near Brodhead Avenue is the Sayre Observatory, the gift of Robert H. Sayre, Esq., of South Bethlehem, containing an equatorial and a zenith telescope, transit instrument and astronomical clock.

THE NEW LABORATORIES

will be completed by September 1st, 1884.

The building, which is thoroughly fire-proof, is built of sandstone, and is 219 feet in length by 44 in width, with a wing 95 feet by 50 feet devoted to the Department of Metallurgy.

There are two principal stories and a basement. The upper floor of the main building is occupied by the quantitative and the qualitative laboratories, the former accommodating 48 and the latter 84 students. These rooms are 20 feet in height and are well lighted and ventilated.

The first floor contains a large lecture room, a recitation room, a chemical museum, and laboratories for organic, physiological, agricultural and applied Chemistry.

In the basement is the large laboratory for furnace assay of ores and a well appointed laboratory for gas analysis.

A photographic laboratory is located in the third story of the central portion of the main building.

Great consideration has been devoted to the ventilation, lighting and heating of the entire building and the equipment with apparatus will receive careful attention. In completeness and conveniences, it will be unsurpassed by any similar establishment in the country.

OTHER BUILDINGS.

To the west, within the grounds, are the houses of the President and Professors, comporting in architecture with Packer Hall. Fronting on Packer Avenue stand Christmas Hall and Saucon Hall, commodious brick edifices, heated by steam and lighted by gas, containing students' rooms, and a mess hall.

EXPENSES.

Tuition is FREE in all branches and classes. Books, materials, paper, pencils, chemical materials used in the analytical laboratory and drawing instruments, are furnished by the student.

Rooms and board can be had in University buildings, under the following rules:

1. The room-rent, for each term, must be paid in advance to the Treasurer of the University. The price for board must also be paid monthly in advance.

2. The charge for board and room-rent shall be $5 per week. Where two students occupy a room jointly, the charge shall be $4.50 per week for each.

The charge for board shall be $4 per week. The charge for room without board shall be $2 per week for each room.

These prices include heat and a moderate consumption of gas.

3. The choice of rooms shall be in the order of the classes; in any class the first applicant to have the first choice.

4. Students may retain their rooms from year to year by giving notice of their intention so to do at the close of the academic year, and by procuring their tickets therefor on or before the first day of the next term.

5. Students are required to keep their rooms in order, or to employ some proper person to do so for them and to pay for any damage done them.

6. No furniture for rooms will be provided by the University.

7. The use of kerosene, coal oil or burning fluid, in any of the buildings, is prohibited.

The following is an estimate of the necessary expenses for the collegiate year, clothing and traveling not included:

Board for 40 weeks,	from $160	to	$200
Room rent, with fuel and lights,	40	"	80
Care of room and use of furniture,	5	"	20
Washing and incidentals,	20	"	40
Books, stationery, etc.,	25	"	50
Total,	$250	to	$390

Note.—If clubs be formed the cost of board need not exceed $3.50 per week.

ADMISSION OF STUDENTS.

ENTRANCE EXAMINATIONS.

Application for admission into the University should be made to the President, from whom all information may be obtained.

DATE OF EXAMINATIONS.

Examinations for admission to the University are held at the opening of each term, and also in June at the close of the Academic year.

The examinations for 1884 will be on Tuesday and Wednesday, January 8 and 9, for admission to the second term; on Friday, Saturday and Monday, June 13, 14, and 16, and on Monday, Tuesday, and Wednesday, September 1, 2, and 3, for admission to the first term. No other examinations for entrance will be held, except for good cause, and all applicants *must* be in attendance at 8.30 on the morning of the first day.

CHARACTER OF THE EXAMINATIONS.

The examinations are rigorous and cover the entire ground laid down in the following scheme. They are all conducted in *writing*, supplemented by an oral examination at the option of the examiner.

All candidates for admission must be at least sixteen years of age. Must present testimonials of good moral character, and, except those specified below, satisfactorily pass in the following subjects:

1. *English Grammar,* including composition, spelling, and punctuation. It is recommended that candidates have a knowledge of Latin Grammar, although an examination in it is not required for any courses except the Classical and the Latin-Scientific.

2. *Geography,* general and political.

3. *History of the United States,* including the *Constitution.*

4. *Physical Geography,* Mitchell's or Guyot's, or an equivalent.

[NOTICE.—At the entrance examinations in June 1885, *Elementary Physics* will be substituted for Physical Geography. The course required in this subject is such as is contained in the *latest* school text books.

The works on Elementary Physics of Balfour Stewart. Avery, or Gage are recommended.

N. B.—*This examination will be rigid.*]

5. *Arithmetic,* including the metric system of weights and measures.

6. *Algebra,* Fundamental Principles. Factoring. Least Common Multiple. Greatest Common Divisor. Fractions. Involution. Evolution. Radicals. Imaginary Quantities. Equations of the First and Second Degrees. Ratio. Proportion and Progressions.

[Olney's University Algebra is recommended, as it is the text book used in the University.]

7. *Geometry,* Fundamental Principles. Rectilinear Figures. The Circle. Proportional Lines and Similar Figures. Comparison and Measurement of the Surfaces of Rectilinear Figures. Regular Polygons. Measurement of the Circle. Maxima and Minima of Plane Figures. The Plane and Polyhedral Angles.

[Chauvenet's Geometry, (six books) is recommended, as it is the text book used in the University.]

The requirements above given are for the Courses in *Science* and *Letters; Civil, Mechanical and Mining Engineering;* and *Analytical Chemistry:* but for admission to the other courses the examinations, *in addition* are as follows:

For the Latin-Scientific and Classical Courses.

8. *Latin Grammar*, (Harkness, preferred).
9. *Cæsar*, four books of the Gallic war.
10. *Cicero*, six orations, including the four against Cataline.
11. *Virgil*, the Bucolics and the first six books of the Aeneid, including Prosody.
12. The translation, at sight, of passages from Cæsar and Cicero.
13. The translation of English into Latin. (As special importance is given this part of the examination, it is suggested to teachers that they connect exercises in making Latin both oral and written with all the studies of the preparatory course.)
14. *Roman History*, Creighton's Primer of Roman History is suggested as indicating the amount required.

For the Classical Course Only.

15. *Greek Grammar*, (Goodwin's preferred).
16. *Xenophon*, Anabasis, four books.
17. *Homer*, Iliad, three books including Prosody.
18. The translation, at sight, of a passage from some work of Xenophon.
19. *Greek History*, Fyffe's Primer of Greek History is suggested.
20. Writing Greek with accents.

The pronunciation of Greek according to the written accents is followed in the University, and it is desirable that students preparing to enter be taught this system.

CONDITIONAL ADMISSION.

A candidate failing to pass in one or more of the subjects required for admission may, at the discretion of the Faculty, be admitted to his class conditionally, to make up his deficiencies by extra study. When they are made up, he will be received into full standing in his class.

SPECIAL STUDENTS.

Young men who do not desire to take a full regular course may enter, upon a satisfactory examination, and select special shorter courses, with the sanction of the Faculty.

ADMISSION TO ADVANCED STUDIES.

Candidates for admission to advanced studies *in any course* are required to pass, *in addition to the entrance examinations for that course,* examinations in the work already done by the classes which they desire to enter.

Such additional subjects may be found in the programme of studies.

CANDIDATES FROM OTHER COLLEGES.

A certificate of honorable dismissal from another college will be received in lieu of the *Primary Entrance Examination only.*

ADMISSION TO THE POST GRADUATE COURSES.

Students of this University who have taken their *first* degree, and others, on presenting a diploma of an equivalent degree conferred elsewhere, are admitted to advanced studies, according to the plan to be found under the general subject of Graduate Students.

NOTE.—The acceptance of a certificate as evidence of proficiency, in lieu of examination, is at the discretion of each Professor as to the subjects in his department.

PROGRAMME OF STUDIES,

Showing the number of exercises per week for each subject, and the Text-books used.

The following is presented as the general programme of instruction, subject to such modifications from time to time as the Faculty may deem expedient, with the approval of the Trustees.

The names of the text-books studied are generally mentioned. The number of exercises per week in each subject is indicated by the figure in parenthesis immediately following.

Two hours of Drawing, three of work in the Laboratory, or three of practice in the field, are regarded as equivalent to a recitation or lecture of one hour's duration.

During the year, Prof. Ringer will deliver a course of lectures on the History of Europe, from the Congress of Vienna in 1815 to the Congress of Berlin in 1878.

THE SCHOOL OF GENERAL LITERATURE.

This school is intended to correspond to the course long established in our older colleges, modified by the needs and requirements of modern culture. Its object is to impart a comprehensive and liberal education to those who design to enter upon professional rather than technical pursuits.

It comprises three distinct courses: I. The Classical Course, or Course in Arts; II. The Latin-Scientific Course, or Course in Philosophy; III. The Course in Science and Letters.

THE CLASSICAL COURSE.

This course is chiefly designed for those who purpose to study Law and Theology; it includes full and rigorous instruction in the Ancient classics, in Elementary Science and in General Literature. The study of Mathematics in this course embraces Algebra, Geometry, Trigonometry, Analytical Geometry, and the Calculus. The programme includes Physics, Chemistry and Elementary Mechanics. There are full courses in History, in the Science of Language and in the origin and growth of the English Language. There are also lectures on Psychology, the Christian Evidences, International and Constitutional Law and Political Economy. Lectures on English Literature are supplemented by critical readings of the standard English authors. The graduate in this course obtains the degree of Bachelor of Arts (B.A.).

FRESHMAN CLASS.

FIRST TERM.

Mathematics.—Geometry (Chauvenet) completed. (5)

Physics.—Mechanics with Lectures. (2)

Greek.—Homer: Odyssey. Prosody. Testament. History. (4)

Latin.—Livy. Prose Composition. History. Leighton. (4)

Physiology and Health.—Lectures. (1)

English Exercises and Declamations. (1)

SECOND TERM.

Mathematics.—Olney's University Algebra, Pt. III. Plane and Spherical Trigonometry and Mensuration. Use of Logarithmic Tables. (5)

Chemistry.—Lectures. Fowne's Elementary Chemistry. (3)

Greek.—Xenophon: Memorabilia of Socrates. Testament. History. (4)

Latin.—Cicero: De Amicitia. Horace: Odes and Epodes. Composition, Prosody and History. (4)

English Exercises and Declamations. (1)

SOPHOMORE CLASS.

FIRST TERM.

Mathematics. — Analytical Geometry. Olney's General Geometry. (4)

Chemistry.—Lectures and Laboratory Practice. Galloway's Qualitative Analysis. (3)

Physics.—Heat, Meteorology, Magnetism and Statical Electricity, with Lectures and Laboratory Practice. (3)

Greek.—Felton's Greek Historians. History. (3)

Latin.—Tacitus: Agricola and Germania. Composition. History. (3)

English Exercises and Declamations. (1)

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Light and Acoustics, with Lectures and Laboratory Practice. (4)

English.—Coppée's Rhetoric, with Kellogg's Praxis. (1)

History.—Outlines of the World's History. (2)

Greek.—Euripides: Medea. (3)

Latin. — Quintilian: Book X. Horace: Satires and Epistles. Composition. (3)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

History.—Outlines of the World's History. (2)

Philosophy.—Coppée's Logic. (2)

English.—Coppée's English Literature. (4)

French.—Grammar. Written and Oral Translations. Chapsal: Litterature Française. (3) Or *German.*—Grammar. Translation from German into English and *vice versa.* (3)

Greek.—Sophocles: Electra. Antiquities. (3)

Latin.—Plautus and Terence. Roman Antiquities: Wilkins. (3)

Essays and Original Orations.

SECOND TERM.

History.—History of England: Hume. (3)

Philosophy.—Schuyler's Psychology. (2) Political Economy. (1)

English.—Earle's Philology of the English Tongue. (2)

French.—Grammar. Written and Oral Translations. Chapsal: Litterature Française. (3) Or *German.*—Grammar. Systematic Reading of various authors. Translation. Dictation. (3)

Greek.—Aristophanes: Clouds. (3)

Latin.—Juvenal and Persius. Pliny: Select Epistles. Cruttwell's History of Roman Literature. (3)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

International Law.—Lectures: Woolsey. (2)

History.—Decline and Fall of the Roman Empire: Gibbon. (3)

Philosophy.—History of Philosophy: Tennemann. (2)

Astronomy.—Loomis' Treatise with Lectures. (3)

French.—Grammar. Systematic Readings of various authors. Dictation. Compositions. (3) Or *German.*—Grammar. Systematic Readings. German Compositions. Lectures on German Literature. (3)

Latin.—Lucretius, with Lectures. Roman Literature. (2)

Greek.—Pindar: Selected Odes. Greek Literature. (2)

Essays and Original Orations.

SECOND TERM.

Constitutional Law.—Lectures. (1)

History.—History of France. (2)

Philosophy.—Moral Philosophy: Whewell. (1) Philosophy of History. Lectures. (2)

Christian Evidences. (1)

French.—Systematic Readings. Compositions. Lectures in French on French Literature. Demogeot: Litterature Française. (3) Or *German.*—Systematic Readings. German Composition. Lectures in German on German Literature. Scherr: Geschichte der deutschen Literatur. (3)

Geology.—Lectures. Le Conte. (2)

Latin.—Catullus, Tibullus and Propertius. Cicero: de Officiis, with Lectures. Roman Literature (completed). (2)

Greek.—Demosthenes: Public Orations. Greek Literature (completed). (2)

Lectures on American and English Literature. (2)

Preparation of Thesis.

THE LATIN-SCIENTIFIC COURSE.

The Latin Scientific Course leading to the degree of Bachelor of Science (B.S.) is based on Latin, without Greek, and designed for those who prefer studies of a philosophical nature.

FRESHMAN CLASS.

FIRST TERM.

Mathematics.—Geometry (Chauvenet) completed. (5)

Physics.—Mechanics with Lectures. (2)

History.—History of Ancient Greece. (1)

German.—Worman's Grammar. Writing in German Text. Translation into English. (3)

Latin.—Livy. Prose Composition. History: Leighton. (4)

Physiology and Health.—Lectures. (1)

English Exercises and Declamations. (1)

SECOND TERM.

Mathematics.—Olney's University Algebra, Part III. Plane and Spherical Trigonometry and Mensuration. Use of the Logarithmic Tables. (5)

Chemistry.—Lectures. Fownes' Elementary Chemistry. (3)

History.—History of Ancient Greece. (1)

German.—Worman's Grammar. Translations: Ahn's Second German Reader. (3)

Latin.—Cicero: De Amicitia. Horace: Odes and Epodes. Composition, Prosody and History. (4)

English Exercises and Declamations. (1)

SOPHOMORE CLASS.

FIRST TERM.

Mathematics.—Analytical Geometry: Olney's General Geometry. (4)

Chemistry.—Lectures and Laboratory Practice. Galloway's Qualitative Analysis. (3)

Physics.—Heat, Meteorology, Magnetism and Statical Electricity, with Lectures and Laboratory Practice. (3)

German.—Worman's Grammar. Translations from German into English. (2)

History.—History of Ancient Greece. (1)

Latin.—Tacitus: Agricola and Germania. Composition. History. (3)

English Exercises and Declamations. (1)

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Light and Acoustics, with Lectures and Laboratory Practice. (4)

English.—Coppée's Rhetoric, with Kellogg's Praxis. (1)

German.—Grammar. Systematic Readings of various authors. Translation. Dictation. (2)

History.—Outlines of the World's History. (2)

Latin.—Quintilian: Book X. Horace: Satires and Epistles. Composition. (3)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

History.—Outlines of the World's History. (2)

Philosophy.—Coppée's Logic. (2)

English.—Coppée's English Literature. (4)

French.—Grammar. Oral Translation from French into English. Written Translation from English into French. (3)

German.—Systematic Readings of various authors. Compositions in German. (2)

Latin.—Plautus and Terence. Roman Antiquities: Wilkins. (3) Sight Reading and Conversation. (1)

Essays and Original Orations.

SECOND TERM.

History.—History of England: Hume. (3)

Philosophy.—Schuyler's Psychology. (2) Political Economy. (1)

English.—Earle's Philology of the English Tongue. (2)

French.—Grammar. Written and Oral Translations. Chapsal: Litterature Française. Dictation. (3)

German.—Systematic Reading of various authors. Compositions in German. (2)

Latin.—Juvenal and Persius. Pliny: Select Epistles. Cruttwell's History of Roman Literature. (3)

Biology.—Nicholson. (1)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

International Law.—Lectures: Woolsey. (2)

History.—Decline and Fall of the Roman Empire: Gibbon. (3)

Philosophy.—History of Philosophy: Tennemann. (3)

Astronomy.—Loomis' Treatise with Lectures. (3)

French.—Grammar. Systematic Reading of various French authors. Dictation. Compositions. (3)

Latin.—Lucretius, with Lectures. Roman Literature. (2)

German.—Systematic Readings of various German authors (continued). Lectures on German Literature. Scherr: Geschichte der deutschen Literatur. (3)

Essays and Original Orations.

SECOND TERM.

Constitutional Law.—Lectures. (1)

History.—History of France. (1)

Philosophy.—Moral Philosophy: Whewell. (1) Philosophy of History. Lectures. (2)

Christian Evidences. (1)

Geology.—Lectures. Le Conte. (2)

Latin.—Catullus, Tibullus and Propertius. Cicero: de Officiis, with Lectures. Roman Literature (completed). (2)

French.—Systematic Readings. Compositions. Lectures in French on French Literature. Demogeot: Litterature Française. (3)

Lectures on American and English Literature. (2)

German.—Lectures on German Literature. Scherr: Geschichte der deutschen Literatur. (1)

Preparation of Thesis.

THE COURSE IN SCIENCE AND LETTERS.

The Course in Science and Letters, leading to the Degree of Bachelor of Science (B.S.), is designed for those who wish to pursue both Scientific and Literary studies without Latin and Greek. These being omitted, extended instruction is given in French and German, History, General Literature, Mathematics and General Science.

FRESHMAN CLASS.

FIRST TERM.

Mathematics.—Geometry, (Chauvenet) completed. (5)

Physics.—Mechanics, with Lectures. (2)

History.—History of Ancient Greece and Rome. (2)

English.—Rhetorical Praxis: Kellogg, with Essays and Declamations. (2)

German.—Worman's Grammar. Writing in German Text. Translation into English. (3)

Drawing.—Elementary projections, shading and lettering. (2)

Physiology and Health.—Lectures. (1)

SECOND TERM.

Mathematics.—Olney's University Algebra, Part III. Plane and Spherical Trigonometry and Mensuration. Use of the Logarithmic Tables. (5)

Chemistry.—Lectures. Fownes' Elementary Chemistry. (3)

History.—History of Ancient Greece and Rome. (2)

German.—Worman's Grammar. Translations: Ahn's Second German Reader. (4)

Botany.—Lectures and Laboratory Work. Gray. (1)

Drawing.—Projection Drawing. Elements of Descriptive Geometry. (2)

English Exercises and Declamations. (1)

SOPHOMORE CLASS.

FIRST TERM.

Mathematics.—Analytical Geometry: Olney's General Geometry. (4)

Chemistry.—Lectures and Laboratory Practice. Galloway's Qualitative Analysis. (4)

Physics.—Heat, Meteorology, Magnetism and Statical Electricity, with Lectures and Laboratory Practice. (3)

German.—Worman's Grammar. Translations from German into English. (2)

History.—History of Ancient Greece and Rome. (2)

English Exercises and Declamations. (1)

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (3)

Physics.—Galvanism, Light, and Acoustics, with Lectures and Laboratory Practice, (5)

English.—Coppée's Rhetoric, with Kellogg's Praxis. (1)

German.—Systematic Readings of various authors. Translation. Dictation. (2)

History.—Outlines of the World's History. (2)

Zoology.—Lectures and Laboratory work (vertebrates and invertebrates). Tenney. (3)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

History.—Outlines of the World's History. (2)

Philosophy.—Coppée's Logic. (2)

English.—Coppée's English Literature. (4)

French.—Grammar. Oral Translation from French into English. Written Translation from English into French. (3)

German.—Systematic Reading of various authors. Compositions in German. (2)

Crystallography.—Lectures with Practical Exercises in the determination of Crystals. (2)

Zoology.—Lectures and Laboratory work (vertebrates): Tenney 2)

Essays and Declamations.

SECOND TERM.

History.—History of England: Hume. (3)

Philosophy.—Schuyler's Psychology. (2) Political Economy. (1)

English.—Earle's Philology of the English Tongue. (2)

French.—Grammar. Written and Oral Translations. Chapsal: Litterature Française. Dictation. (3)

German.—Systematic Reading of various authors. Compositions in German. (2)

Mineralogy.—Descriptive Mineralogy, with practical exercises in the determination of Minerals. (3)

Biology.—Nicholson. (1)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

International Law.—Lectures: Woolsey. (2)

History.—Decline and Fall of the Roman Empire. (3)

Philosophy.—History of Philosophy: Tennemann. (2)

Astronomy.—Loomis' Treatise, with Lectures. (3)

French.—Grammar. Systematic Reading of various French authors. Dictation. Composition. (3)

Geology.—Lithology and Laboratory Practice. Formation of Strata. General Definitions of Geology. (3)

German.—Systematic Readings of various German authors (continued). Lectures on German Literature. Scherr: Geschichte der deutschen Literatur. (1)

Essays and Original Orations.

SECOND TERM.

Constitutional Law.—Lectures. (1)

History.—History of France. (2)

Philosophy.—Moral Philosophy: Whewell. (1) Philosophy of History. Lectures. (2)

Christian Evidences. (1)

French.—Systematic Readings. Conversation. Lectures in French on French Literature. Demogeot: Litterature Française. (3)

Geology.—Historic, Dynamic and Economic Geology. (4)

Lectures on American and English Literature. (2)

German.—Lectures on German Literature. Scherr: Geschichte der deutschen Literatur. (1)

Preparation of Thesis.

THE SCHOOL OF TECHNOLOGY.

This school includes four distinct courses: I. The Course in Civil Engineering; II. The Course in Mechanical Engineering; III. The Course in Mining and Metallurgy; IV. The Course in Chemistry. These have the same curriculum of studies for the first three terms (one year and a half). At the end of that time the student selects his course and follows its programme.

FRESHMAN CLASS.

FIRST TERM.

Mathematics.—Chauvenet's Geometry, (completed). (5)

Physics.—Mechanics, with Lectures. (2)

German.—Worman's Grammar. Writing in German Text. Translations into English. (3) Or *French.*—Languillier and Monsanto's Practical French Course. Keetel's Analytical Reader. (3)

Drawing.—Elementary Projections, Shading and Lettering. Free-hand Drawing. (3)

English.—Exercises and Declamations. (2)

Physiology and Health.—Lectures. (1)

SECOND TERM.

Mathematics.—Olney's University Algebra, Part III. (3) Plane and Spherical Trigonometry and Mensuration. Use of Logarithmic Tables. (2)

Chemistry.—Lectures. Fowne's Elementary Chemistry. (3)

German.—Woman's German Grammar. Translations. Ahn's Second German Reader. (3) Or *French.*—Languillier and Monsanto's Practical French Course. Translations. Keetel's Analytical Reader. (3)

Botany.—Lectures and Practice. Gray. (1)

Drawing.—Projection Drawing. Descriptive Geometry. (2)

English.—Exercises and Declamations. (2)

SOPHOMORE CLASS.

FIRST TERM.

Mathematics.—Analytical Geometry: Olney's General Geometry. (4)

Chemistry.—Lectures and Laboratory Practice: Galloway's Qualitative Analysis. (5)

Physics.—Heat, Meteorology, Magnetism and Statical Electricity with Lectures. Laboratory Practice in these branches and Mechanics. Barometric leveling and Measurement of heights. (3)

German.—Worman's Grammar. Oral Translations. Ahn's Reader. (2) Or *French.*—Languillier and Monsanto's Practical French Course. Translations. Keetel's Analytical Reader. (2)

English.—Exercises and Declamations. (1)

For the Courses in Civil and Mechanical Engineering.

Drawing.—Isometric Drawing. Architectural Drawing. (2)

For the Courses in Mining Engineering and Analytical Chemistry.

Stoichiometry. (2)

THE COURSE IN CIVIL ENGINEERING.

The special studies in this course may be grouped under the heads of surveying, applied mechanics and construction. The work in surveying extends over five terms and embraces land surveying, leveling, topography, triangulation, railroad reconnaissance and location, hydrography, and the elements of geodesy. Much time is devoted to actual practice in the field and drafting room, each student being required to become proficient in the use of instruments and in taking notes for profiles and maps. The work in applied mechanics comprises the strength and elasticity of materials, the theory of the equilibrium of arches, roofs and bridges, the mechanics of machinery, hydraulics and hydraulic motors. Here the theoretical principles are illustrated by examples and problems drawn from actual engineering practice. The work in construction familiarizes the student with the qualities of materials, with masonry and foundations, the different forms of bridges, the methods employed in the building of roads and railroads, and with the arrangement of systems of water supply and sewerage. Visits of inspection to the engineering works in Bethlehem and vicinity are regularly made. Plans, drawings, and estimates of cost are prepared by each student for the construction of a line of railroad, and also for a pier, arch, and a Howe truss bridge.

Besides these special studies there is a course in astronomy which includes practical work in the observatory. The study of English and of French or German is continued, and instruction is given in mineralogy, lithology and geology.

The student who completes all the studies of this course will receive the degree of Civil Engineer (C.E.).

SOPHOMORE CLASS.

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Acoustics, Light, with Lectures and Laboratory Practice. (5)

German or *French.*—Grammar. Systematic Readings. Translations. (2)

Drawing.—Line Shading. Sketching. Drawing of Structures from actual Measurement. (2)

Surveying.—Use of Compass, Level and Transit. Maps of Farm Surveys. Profiles and Contour Maps. (3)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

Mathematics.—Integral Calculus: Courtenay. (2)

German or *French.*—Readings. Translation. Dictation. (2)

Mechanics.—Mathematical Theory of Motion. Science of Motion in General. Statics. Dynamics, and Statics of Fluids. Lectures on the Theory of Centre of Gravity and Moment of Inertia. (5)

Surveying.—Triangulation. Leveling. Topographical Surveys and Maps. (4)

Construction.—Materials of Construction. Carpentry. Masonry. Foundations. Descriptions of Structures. (1)

Crystallography.—Lectures, with practical exercises in the determination of crystals. (2)

Essays and Declamations.

SECOND TERM.

German or *French.*—Readings. Compositions. (2)

Strength of Materials.—Elasticity and strength of wood, stone, and metals. Theory of columns, shafts, and beams. Testing of materials. (3)

Surveying.—Railroad Reconnoissance and Location. Survey of a Line, with profile, map and estimate of cost. (4)

Construction.—Stone cutting with practical drawings. (2) Construction and maintenance of Roads; Theory of retaining walls and arches. (2)

Mineralogy.—Descriptive Mineralogy, with practical exercises in the determination of minerals. (3)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

Astronomy.—Descriptive Astronomy. Loomis. (3)

Graphical Statics.—Analysis of roof trusses and arches. (2)

Roofs and Bridges.—Theory and calculation of strains. (2) Reports on stability of bridges; Design for a railroad bridge. (3)

Surveying.—Use of plane table and sextant. Hydrographic survey and map. (2)

Mechanics of Machinery.—Pile drivers, cranes, and elevators. The Locomotive. (2)

Geology.—Lithology, with practical exercises in determining rocks. (2)

SECOND TERM.

Astronomy.—Practical Astronomy as applied to Geodesy and Navigation. Lectures and Observatory work. Determination of Latitude, Longitude and Azimuth. Practice with the Sextant, Transit and Zenith Telescope. (2)

Surveying.—Elements of geodesy. Elements of method of least squares. (2)

Hydraulics.—Hydrostatics. Flow of water in pipes and rivers. Hydraulic motors.

Construction.—Water supply engineering and sewerage. Specifications and Contracts. (4)

Geology.—Historic and dynamic. Le Conte. (2)

English Literature.—Lectures. (2)

Christian Evidences.—Lectures. (1)

Preparation of Thesis.

THE COURSE IN MECHANICAL ENGINEERING.

The object of this course is the study of the Science of Machines; the principal subjects taught are: the nature, equivalence and analysis of mechanisms, the mechanics or theory of the principal classes or types of machinery, Mechanical Technology and the principles and practice of Machine Design.

That the students may obtain the practical engineering data which they will most need when beginning their work as mechanical engineers, they are required to pursue a course of Shop Instruction which does not necessarily involve manual labor and manipulation of tools but is principally devoted to familiarizing them with those points in pattern-making, moulding, forging, fitting and finishing, which they need to know as designers of machinery. Particular attention is therefore directed to the forms and sizes of machine parts that can be readily constructed in the various workshops, to the time that it takes to perform and the order of the various operations, to the dimensions most needed by workmen (in order that the students may learn to dimension working drawings judiciously) and to the various devices—ordinarily escaping the beginner's notice—for increasing the accuracy of the work, durability of the parts, conveniences of manipulation and safety of the workmen. This involves acquaintance with the processes and machinery of the workshops, but it is the foreman's and superintendent's knowledge which is required rather than the manual dexterity and skill of the workman and tool-hand. The acquirements peculiar to the latter are by no means despised, and students are encouraged to familiarize themselves therewith during leisure hours, but manual work in the shops forms no regular part of the course. On the contrary, the student enters the shop with hands and mind free to examine all the processes, operations and machinery, and ready at any moment at the call of the teacher, to witness an operation of special interest or to examine into the causes of and remedies for any sudden break down. Dressed in overalls and provided with note-book, pencil, calipers and measuring rule, the student sketches the important parts of the various machine-tools, notes down the successive steps of each of the important shop-processes as illustrated by the pieces operated upon, and, having first obtained a clear idea from the working drawing of what is about to be constructed, follows pieces of work through the shops from the pig or merchant form to the finished machine.

That the students may learn to observe carefully and be trained to think and observe for themselves in these matters, there is required of them a full description of the various processes, operations and tools involved in the production of each one of a series of properly graded examples of patterns, castings, forgings and finished pieces which are not being constructed in the shops at the time and the drawings or blue prints for which have been given to them on entering the shops. The student's work is directed not only by these drawings and by the printed programme given him at the start, but also personally by a teacher, who accompanies him into the shops, gives necessary explanations, and tests the extent and accuracy of his knowledge by examining the sketches and notes, and by frequent questioning. Finally the results of the observations and the sketches made are to be neatly embodied in a memoir.

During the course there are frequent visits of inspection to engineering works, both in and out of town, with special reference to such subjects as Prime Movers, Machinery for lifting, handling and transporting, and Machinery for changing the form and size of materials. It is intended that each of these excursions shall have some definite purpose in view which must be fully reported by the students.

The instruction in Machine Design, during the second term of Junior year, consists in determining rational and empirical formulas for proportioning such machine parts as come under the head of fastenings, bearings, rotating, sliding and twisting pieces, belt and toothed gearing, levers and connecting rods, also in comparing recent and approved forms of these same parts with respect to their advantages as regards fitness, ease of construction and durability, and in making full-sized working-drawings of these parts; all the dimensions are determined by the students from the above mentioned formulas, the data being given as nearly as possible as they would arise in practice. During the Senior year, the students undertake the calculations, estimates and working drawings involved in the design of a simple but complete machine, each student being engaged upon a different machine. From the finished drawings of each machine, tracings are made and then "blue prints" taken for distribution among the other members of the class. The whole class also take up the design of a steam engine, every dimension being determined by the students, and complete working drawings made. In the case of the simple machines and of the steam engine, the general plan or arrangement will be given to the students in the form of rough sketches, photographs or wood-cuts. This work will continue to the middle of the last term of the Senior year. From this time on the students are expected to make original designs for simple mechanisms, whose object has been fully explained. Throughout the course the work in the draughting room is carried on as nearly as possible like that of an engineering establishment, and special attention is paid to methods of expediting the work of calculation by means of simple formulas, tables and diagrams.

The graduate in this course will receive the degree of Mechanical Engineer (M.E.).

SOPHOMORE CLASS.

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Acoustics, Light, with Lectures and Laboratory Practice. (5)

German.—Grammar. Systematic Readings. Translation. Dictation. (2) Or *French.*—Grammar. Systematic Readings. Dictation. (2)

Drawing.—Line Shading. Sketching. Drawing of Machines from actual measurement. (2)

Kinematics of Machinery.—Reuleaux. Nature and Equivalence of Mechanisms. (3)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

Mathematics.—Integral Calculus: Courtenay. (2)

German. Systematic Readings. Compositions. (2) Or *French.*—Systematic Readings. Compositions. (2)

Mechanics.—Mathematical Theory of Motion. Science of Motion in general. Statics. Dynamics and Statics of Fluids. Lectures on Theory of Centre of Gravity and Moment of Inertia. (5)

Mechanical Technology.—Shop instruction. Examination of the processes and appliances involved in pattern making, molding, forging, fitting and finishing, with sketches and reports. (7)

Essays and Declamations.

SECOND TERM.

German.—Systematic Readings. Compositions in German. (2) Or *French.*—Systematic Readings. Compositions. (2)

Strength of Materials.—Elasticity and strength of wood, stone and metals. Theory of beams, shafts and columns. Experimental tests. (3)

Steam Engines.—Rigg's Practical Treatise. (2)

Boilers.—Wilson. Strength, construction and wear and tear of boilers. (1)

Machine Design.—Proportioning of such machine parts as come under the head of Fastenings, Bearings, Rotating and Sliding Pieces, Belt and Toothed Gearing, Levers and Connecting Rods. (4)

Metallurgy. — Metallurgical Processes. Furnaces. Refractory Building Materials. Combustion. Natural and Artificial Fuels. Metallurgy of Iron. (4)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

Thermodynamics.—General principles; application to Steam Engines and Air Compressors. (3)

Graphical Statics. — Graphical analysis of roof trusses and girders. (2)

Machine Design.—Calculations and working drawings for a High Speed Steam Engine. (4)

Kinematics.—Diagrams of the changes of position, speed and acceleration in mechanisms. Link and valve motions. Quick return motions. Parallel Motions. Laying out of Cams. (3)

Mechanics of Machinery.—Weisbach-Herrmann. Hoisting Machinery, Accumulators, Cranes and Locomotives. (4)

SECOND TERM.

Mechanics of Machinery.—Weisbach-Hermann. Pumps, Pumping Engines, Blowing Engines, Compressors and Fans. (4)

Machine Design.—Calculations and working drawings for the following machines: Drilling, Shaping, Milling, Shearing and Punching Machines, Hoists, Pumps and Stone Crushers. Original Designs. (5)

Hydraulics.—Hydrostatics. Flow of water in pipes and channels; hydraulic motors. (2)

Measurement of Power.—Indicating of Steam Engines; determination of evaporative efficiency of boilers; dynamometer experiments. (1)

English Literature.—Lectures. (1)

Christian Evidences.—Lectures. (I)

Preparation of Thesis.

THE COURSE IN MINING AND METALLURGY.

In addition to the physics, chemistry, literature, higher mathematics and mechanics necessary to all technical education, the scheme of studies comprises courses in mining, metallurgy, geology, mineralogy, dynamics, qualitative and quantitative analysis, blowpipe analysis, topographical and mine surveying and drawing. On account of the great number and scope of the studies necessary to the completion of this course, it is five years in length.

The graduate in this course will receive the degree of Engineer of Mines (E.M.).

At the completion of the fourth year of this course, the student will receive the degree of Bachelor of Metallurgy (B.M.).

In the course of mineralogy, geology and analytical chemistry, much attention is paid to the practical instruction of the student in determining minerals by their crystallographical and physical properties, and, by the aid of blowpipe analysis, in the determination of rocks; in the qualitative and quantitative examination of ores and metallurgical products and in the rapid methods of assaying ores by the dry and wet ways employed in metallurgical laboratories. The location of the University in the vicinity of the iron works of the Lehigh Valley and especially of the extensive establishment of the Bethlehem Iron Company, affords unusual facilities for the practical study of iron metallurgy. The processes for the manufacture of spelter and oxide of zinc may be studied at the Bethlehem Zinc Works. The facilities for the practical study of mining and economic geology are not excelled by those of any other Institution in the country.

The zinc mines at Friedensville and the brown hematite and slate deposits of the Lehigh Valley are in the immediate vicinity, while within easy reach by rail are the anthracite coal fields of Pennsylvania, the iron and zinc mines of New Jersey, and the celebrated iron mines at Cornwall, Pa.

SOPHOMORE CLASS.

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Acoustics, Light, with Lectures and Laboratory Practice. (5)

German or *French.*—Grammar. Systematic Readings. Translation. Dictation. (2)

Chemistry.—Quantitative Analysis: Laboratory Work: Fresenius. (5) The following analyses are executed by the student:

1. Iron Wire (Fe)
2. Bronze (Cu, Sn, Zn)
3. Silver Coin (Au, Ag, Pb, Cu)
4. Zinc Ore (Zn) By both Gravimetric and Volumetric Methods.
5. Copper Ore (Cu)
6. Spiegeleisen (Mn)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

Mathematics.—Integral Calculus: Courtenay. (2)

Mechanics.—Mathematical Theory of Motion. Science of Motion in general. Statics. Dynamics and Statics of Fluids. Barometric Leveling and Measurement of Heights. Lectures on Theory of Centre of Gravity and Moment of Inertia. (5)

Chemical Philosophy.—Cooke. (5)

German or *French.*—Systematic Readings. Compositions. (2)

Quantitative Analysis.—Fresenius' Quantitative Analysis. (2) The following analyses are executed by the student:

7. Lead Ore (PbS)
8. Ilmenite (TiO_2)
9. Iron Ore (Complete Analysis)

Essays and Original Orations.

SECOND TERM.

Metallurgy. — Metallurgical Processes. Furnaces. Refractory Building Materials. Combustion. Natural and Artificial Fuels. Metallurgy of Iron. (4)

Blow-Pipe Analysis.—Lectures with Practice: Plattner, Brush, or Nason and Chandler. (1)

Steam Engine.—Rigg's practical treatise. (2)

Strength of Materials.—Elasticity and strength of wood, stone and metals. Theory of beams, columns and shafts. (3)

German or *French.*—Systematic Readings. Compositions. (2)

Chemistry.—Fresenius' Quantitative Analysis. (4) The following analyses are executed by the student:

10. Limestone (Complete Analysis)
11. Coal (Volatile Matter, Fixed Carbon, Ash, H_2O, S, P)
12. Slag (Complete Analysis)
13. Pig Iron (Complete Analysis)
14. Carbon in Steel. (Volumetric.)
15. Nickel Ore (Ni, Co)
16. Gas Analysis (Complete Analysis of Illuminating Gas)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

Metallurgy.—Of Copper, Lead, Silver, Gold, Platinum, Mercury, Tin, Zinc, Nickel, Cobalt, Arsenic, Antimony and Bismuth. (5)

Crystallography..—Lectures with Practical Exercises in the determination of Crystals. (2)

Thermodynamics.—General Principles: Applications to Steam Engines and Air Compressors. (3)

**Mechanics of Machinery.*—Hoisting Machinery, Cranes, Accumulators: Weissbach-Herrmann. (2)

Roofs and Bridges.—Theory and calculation of strains in framed trusses. (2)

**Assaying.*—Including the Assay by the dry methods of Gold, Silver, Antimony, Mercury, Lead, Iron and Tin ores. Laboratory Work. Ricketts. (2)

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* The Assaying is completed by four exercises a week in the first half of the term. The Mechanics of Machinery is then begun.

SECOND TERM.

Mineralogy.—Descriptive Mineralogy, with Practical Exercises in the Determination of Minerals: E. S. Dana. (3)

Blow-pipe Analysis.—Practice. (1)

Hydraulics.—Hydrostatics. Flow of water in pipes and channels; hydraulic motors. (2)

Mechanics of Machinery.—Pumps, Pumping-Engines, Blowing-Engines, Compressors and Fans. (4)

Surveying.—Use of Compass, Level and Transit. Maps of Farm Surveys. Profiles and Contour Maps. (3)

English Literature.—Lectures. (2)

Christian Evidences.—Lectures. (1)

FIFTH YEAR CLASS.

FIRST TERM.

Astronomy.—Descriptive Astronomy: Loomis. (3)

Mining.—Modes of Occurrence of the Useful Minerals. Searching for Mineral Deposits. Examination of Mining Properties. Boring. Mining Tools, Machines and Processes. Timbering and Masonry. Callon. André. (4)

Geology.—Lithology, with practical exercises in determining Rocks. General Geological Definitions and Principles. (3)

Zoology.—Lectures. (2)

Surveying.—Triangulation. Leveling. Topographical Surveys and Maps. (4)

SECOND TERM.

**Mining.*—Methods of Working. Underground Transportation. Hoisting, Drainage and Pumping. Ventilation and Lighting. Mechanical Preparation of Ores. Coal Washing. (3)

**Geology.*—Historic and Dynamic: Dana. Le Conte. (3)

Economic Geology.—Lectures. (2)

**Mine Surveying.*—Practice in the Mines. Map Drawing. (2)

Astronomy.—Practical work. (2)

**Drawing.*—Mining Plant. Systems of Timbering. Geological Maps and Sections. (2)

**Projects.*—In Mining, Geology and Metallurgy. (2)

* These subjects are completed at the end of seventeen weeks. The remainder of the term is taken for preparation of Thesis and practical work.

THE COURSE IN CHEMISTRY.

This course of instruction continues the subject of Theoretical Chemistry from the general course of the two previous terms, the subject of Chemical Philosophy and Organic Chemistry being taught by lectures and recitations in the Junior and Senior years.

In Analytical Chemistry, the Course of Qualitative Analysis in the first term of the second year is followed by Quantitative Analysis, which is pursued to the end of the course, including the Dry Assaying of Ores of gold, silver, antimony, lead, iron and tin, and the Wet Analyses, included in the appended schedule. In the Senior year Organic Chemistry is taught by lectures and Laboratory practice. In addition, courses of Lectures on Physiological, Toxicological, Agricultural and Technical Chemistry are given, and various industrial establishments in the neighborhood and in Philadelphia and New York are visited, in the company of an instructor. The course also includes thorough instruction in Physics and Mechanics, Mineralogy and Blow-pipe Analysis, Metallurgy, Geology and Descriptive Astronomy.

The last term of the Senior year is mainly devoted to the preparation of a Thesis on some subject, selected by the Professor, involving practical work in the Laboratory, in addition to the literary labor, and each graduate will thus make a contribution to the progress of the science as a preliminary to the reception of his degree.

The course is thus seen to include thorough instruction in theoretical and applied chemistry, in their various branches, as well as, in those cognate sciences of such great value to the chemist.

The Laboratories are under the immediate charge of the Professor and his Assistants, and, together with the Lecture-room, are unsurpassed in excellence by any similar establishment in the country, being supplied with all the modern improvements. The collections of apparatus, specimens and models, illustrating theoretical and applied chemistry, are already important and rapidly increasing.

Students are charged for the chemicals and apparatus consumed. If the student is moderately careful, this expense need not exceed $60 per year.

The graduate of this course will receive the degree of Analytical Chemist (A. C.).

SOPHOMORE CLASS.

SECOND TERM.

Mathematics.—Differential and Integral Calculus: Olney. (4)

Physics.—Galvanism, Acoustics, Light: with Lectures and Laboratory Practice. (5)

German.—Grammar. Systematic Readings. Translations. Dictation. (2)

Or *French.*—Grammar. Systematic Readings. Translations. Dictation. (2)

Quantitative Analysis.—Fresenius' Quantitative Analysis. (4)

The following analyses are executed by the students:

1. Iron Wire (Fe)
2. Potassium Dichromate (Cr_2O_3)
3. Barium Chloride (Ba, Cl, H_2O)
4. Magnesium Sulphate (MgO, SO_3 H_2O)
5. Disodium Hydrogen Phosphate (P_2O_5)
6. Bronze (Cu, Sn, Zn)
7. Rochelle Salt (K_2O, Na_2O)
8. Volumetric Determination of Chlorine.
9. Acidimetry (HCl, H_2SO_4, HNO_3, $HC_2H_3O_2$)
10. Alkalimetry (KOH, $NaOH$, NH_4OH, Soda Ash, Pearl Ash)
11. Chlorimetry (Bleaching Powders)

Blow-pipe Analysis.—Lectures with Practice. Plattner, Brush, or Nason and Chandler. (1)

Essays and Declamations.

JUNIOR CLASS.

FIRST TERM.

Chemical Philosophy.—Cooke. (5)

Toxicology.—Lectures. (1)

Quantitative Analysis.—Fresenius' Quantitative Analysis. (6)

The following analyses are executed by the student:

12. Silver Coin (Au, Ag, Pb, Cu)
13. Zinc Ore (Zn) By both Gravimetric and Volumetric Methods.
14. Copper Ore (Cu)
15. Spiegeleisen (Mn)
16. Lead Ore (Pb, S)
17. Ilmenite (TiO_2)

18. Iron Ore (Complete Analysis)
19. Limestone (Complete Analysis)
20. Coal (Volatile Matter, Fixed Carbon, Ash, H_2O, S, P)
21. Slag. (Complete Analysis)

Crystallography.—Lectures, with Practical Exercises in the Determination of Crystals. (2)

German.—Systematic Readings. Compositions in German. (2)
Or *French.*—Systematic Readings. Compositions. (2)

Essays and Original Orations.

SECOND TERM.

Quantitative Analysis.—Fresenius' Quantitative Analysis. (7)

The following analyses are executed by the student:

22. Guano (NH_3, P_2O_5, H_2O)
23. Clay (Complete Analysis)
24. Manganese Ore (MnO_2)
25. Mineral Water (Complete Analysis)
26. Pig Iron (Complete Analysis)
27. Nickel Ore (Ni, Co)
28. Carbon in Steel (Volumetric)
29. Gas Analysis (Complete Analysis of Illuminating Gas)

Metallurgy. — Metallurgical Processes. Furnaces. Refractory Building Materials. Combustion. Natural and Artificial Fuels. Metallurgy of Iron. (4)

German.—Systematic Readings. Compositions, in German. (2)
Or *French.*—Systematic Readings. Compositions. (2)

Mineralogy.—Descriptive Mineralogy, with Practical Exercises in the Determination of Minerals. E. S. Dana. (3)

Essays and Original Orations.

SENIOR CLASS.

FIRST TERM.

Metallurgy.—Of Copper, Lead, Silver, Gold, Platinum, Mercury, Tin, Zinc, Nickel, Cobalt, Arsenic, Antimony and Bismuth. (5)

Assaying.—Including the Assay by the dry methods of Gold, Silver, Antimony, Mercury, Lead, Iron and Tin ores. Ricketts. (1)

Chemical Preparations.—Including the Preparation of Chemical Compounds and the Purification of Chemicals by Distillation, Sublimation, Fusion, Crystallization, Precipitation, etc. (1)

Organic Chemistry.—Lectures and Laboratory Practice. (6)

Astronomy.—Descriptive Astronomy; Loomis. (3)

SECOND TERM.

Chemistry Applied to the Arts.—Lectures. (3)

Physiological Chemistry.—Lectures. (1)

Agricultural Chemistry.—Lectures. (1)

Geology.—Historic, Dynamic and Economic Geology. Lectures. Le Conte. (4)

Christian Evidences.—Lectures. (1)

English Literature and History.—Lectures. (2)

Preparation of Thesis.

THE ADVANCED COURSE IN ELECTRICITY.

This course has been established to answer the growing demand for more extensive and thorough knowledge of the subject of Electricity and its applications to Machines, Telegraphy, Electric Lighting, etc.

Instead of an extended Department of Electrical Engineering including full courses of Mathematics, Mechanics, Chemistry, etc., and extending over four years, it is thought best to offer for the present, a special course, occupying not more than one year and presenting very fully the purely electrical portion of an Electrical Engineering course; with only such outside branches as are absolutely necessary for the proper understanding of this single subject.

Those persons whose time is limited and who desire to take up any of the leading industrial applications of Electricity; or those, who having already been engaged in such work, are familiar with the practice; but wish to gain a knowledge of the theory and scientific principles involved; will find this course very desirable.

No entrance conditions are required, excepting a general knowledge of Algebra, Geometry and Plane Trigonometry and some familiarity with the leading principles of Chemistry.

The course comprises the usual course of Physics in the University including Elementary Mechanics, Heat, Light—with laboratory work in these branches and a much more extended and advanced course of study and laboratory practice in Magnetism, Static and Dynamic Electricity. It gives especial attention to the subject of

Electric Machines, the Telegraph and Telephone, Electric Lighting, with the use of text books, lectures and visits to manufactories, working systems, etc.

The laboratory work in the branch of Dynamic Electricity includes very full practice on the following points:

Setting up, use and care of all the batteries commonly used; Grove's, Bunsen's Daniel's, LeClanchè's, Bichromate, Smee's Gravity, Wollaston's, etc.

Laws of currents; polarization, secondary or storage batteries; Planté's, Faure's, Brush's, etc.

Induced currents, direction, strength, different orders, construction and testing of induction coils; extra currents.

Construction and testing of Electro Magnets; Intensity and Equality Magnets, investigation of laws, testing efficiency with varying current strength, size of wires, number of coils, length and diameter of cores, etc.

Electrolysis, electrotyping, electroplating.

Electro Dynamics, action of circuits on currents, of magnets and earth on currents, construction of solenoids, etc.

Thermo-Electric batteries.

Telegraphic work, measuring and testing telegraph lines for conductivity, insulation, location of faults.

Running and testing electric lights, arc and incandescent. (Swan's, Lane-Fox's, Brush, and Maxim.)

Analysis and use of Electric Machines, Magneto-Electric, Dynamic.

A full course on Electrical Measurements. Construction and testing instruments; sine, tangent and differential galvanometers. Thompson's Mirror galvanometer, voltameters, bridges, rheostats, resistance coils, commutators, shunt, etc. Construction of practical circuits. Experimental verification of Ohm's laws; testing efficiency of different combinations with varying internal and external resistances. Resistance of solid and liquid conductors; simple and divided circuits. Effect of changes of temperature on solid and liquid conductors. Measurement of heat developed by currents. Relative specific resistance. Internal resistance of batteries; establishment of laws, and measurement. Reduced resistance of battery. Measurement of current strength and Electro Motive Force of the batteries in use, by all the known methods; galvanometer constant etc.

PHYSICAL CULTURE.

The Gymnasium is open morning, afternoon, and evening, in all, 45 hours a week. Exercise in it is required of all students who are fitted to take it. Class Drill with the Instructor and individual exercise are prescribed.

GRADUATING THESES.

Every student will be required to present a thesis upon some topic connected with his special course, as a necessary portion of the exercises for his final examination for a diploma. These theses shall be accompanied by drawings and diagrams, when the subjects need such illustration. The originals will be kept by the University, as a part of the student's record, for future reference; but a copy may be retained by the student, and be published, permission being first obtained from the President.

DIPLOMAS AND CERTIFICATES.

The Diploma is given only to those who have passed all the examinations in a regular course and is signed by the President and Secretary of the Board of Trustees and by the Faculty of the University. For all the partial courses a certificate is given showing what the student has accomplished, and is signed by the President and Secretary of the Faculty.

GRADUATE STUDENTS.

Graduate students wishing to remain a year or more and pursue a course of study as candidates for another Degree may do so with the sanction of the Faculty. Those wishing to take *special* courses of study will be afforded every facility for so doing.

POST GRADUATE DEGREES.

M. A.

The Faculty will recommend for the Degree of Master of Arts any Candidate, otherwise properly qualified, who, after taking at this University the Degree of Bachelor of Arts, shall pursue, for at least one year at this University, or two years elsewhere, a course of liberal study prescribed by the Faculty in at least two departments, pass a satisfactory examination in the same and present a satisfactory Thesis.

M. S.

The Faculty will recommend for the Degree of Master of Science any Candidate, otherwise properly qualified, who, after taking at this University the Degree of Bachelor of Science, or any Degree in the School of Technology, shall pursue, for at least one year at this University, or two years elsewhere, a course of study prescribed by the Faculty in at least two departments, pass a thorough examination in the same and present a satisfactory Thesis.

Ph. D.

The Faculty will recommend for the Degree of Doctor of Philosophy any Candidate, otherwise properly qualified, who, after taking at this University the Degree of Master of Arts or Master of Science, shall pursue, for at least one year at this University, or two years elsewhere, a course of advanced study prescribed by the Faculty, pass a thorough examination in the presence of the Faculty in the same and present a satisfactory Thesis giving evidence of original investigation.

The Candidate shall have a good knowledge of Latin and either French or German.

The Theses presented by Candidates for Post Graduate Degrees shall be retained by the University.

THE UNIVERSITY LIBRARY.

The Library Building was erected by the Founder of the University in 1877, at a cost of One Hundred Thousand Dollars, as a memorial of his daughter, Mrs. Lucy Packer Linderman, and during the same year more than Twenty Thousand Dollars were contributed by the family and friends of that estimable woman, as a memorial fund for the purchase of books. By the will of the Founder of the University a fund of $500,000 has been given for the permanent endowment of the Library.

The building is semi-circular in plan, with a handsome façade in the Venetian style of architecture. It is constructed of Potsdam sandstone with granite ornamentation. In the interior, the centre is occupied as a reading space, fifty by forty feet, from which radiate the book cases, extending from floor to ceiling; two galleries affording access to the upper cases. Shelf room is now provided for Eighty Thousand Volumes. The building is thoroughly fireproof, well lighted, and heated by steam.

Forty thousand volumes are now upon the shelves, including many extremely valuable works. The list of periodicals numbers about fifty, embracing as far as possible all departments of knowledge.

The Library is conducted strictly for consultation, and is open to the use of the public; both of which conditions are in accord with the terms of the gift.

REGULATIONS OF THE LEHIGH UNIVERSITY LIBRARY.

I. The Library is open every day, except Sundays and Legal Holidays, from 8 A. M. until 10 P. M., and on Sundays for students and others connected with the University from 1.30 P. M. until 9.30 P. M.

II. Admission is free to all persons over 16 years of age.

III. Readers are required to write their names and addresses in the Daily Register of the Library. They also write the name of the book desired upon a Library Card, with their signatures, and present the same to the Director's Clerk, who supplies the book, retaining the card as a receipt. Before leaving the Library, readers return their books to the clerk, and receive their cards.

IV. No book is permitted, under any circumstances, to be taken from the Library.

V. No person is allowed to enter the alcoves, or remove any book from the shelves, without the permission of the Director.

VI. Readers wishing to consult the more valuable illustrated works make special application for that purpose.

VII. In taking notes, pencils, and not pens and ink, are to be used.

VIII. Audible conversation and the use of tobacco are strictly forbidden in any part of the Library.

IX. Any person not conforming to these Regulations, will be denied the privilege of the Library.

X. Any person, who defaces, in any way, any book, magazine or paper, or the furniture, or any portion of the building in addition to being deprived of the privileges of the Library, will be prosecuted according to law.

OBSERVATORY.

By the liberality of Robert H. Sayre, Esq., one of the Trustees of the University, an Astronomical Observatory was erected on the University grounds, and placed under the charge of the Professor of Mathematics and Astronomy.

In the dome of the observatory is mounted an Equatorial Telescope, of six inches aperture, by Alvin Clark & Sons. The west wing contains a superior Sidereal Clock, by Wm. Bond & Sons; a Zenith Telescope, by Blunt, and a Field Transit, by Stackpole. There is also a Prismatic Sextant, by Pistor & Martins.

Students in Practical Astronomy receive instruction in the use of the instruments and in actual observation.

The grounds upon which the observatory stands, consisting of seven acres of land adjoining the original grant, was presented to the University by Charles Brodhead, Esq., of Bethlehem.

An advanced course in Astronomy and the higher Analysis has been established, requiring two years for its completion. It is adapted to the attainments of the graduates of this University, but is open to any one who may be prepared to pursue it.

This course embraces the following subjects:

First Year. — Spherical Astronomy. Theory of Instruments. Method of Least Squares. Numerical Calculus.

Second Year.—Celestial Mechanics. Interpolation and Quadrature. Computation of Orbits and Perturbations.

During the entire course, the student will have ample opportunity to familiarize himself with the practical work of the Observatory and Computing Room.

STUDENTS' SOCIETIES.

THE CHEMICAL AND NATURAL HISTORY SOCIETY.

This Society was organized in the Fall of 1871, as "The Chemical Society," but was afterwards expanded, as its present title indicates, and admits, by election, students from all departments of the University.

The collections of Chemical Preparations, and Botanical and Zoölogical Specimens belonging to the Society, are already important. During the past years persons have been sent to Texas and Brazil to collect specimens for these cabinets.

The Society has organized and maintained several courses of public scientific lectures. Among the honorary members of the Society are more than one hundred of the most distinguished scientists in Europe and the United States.

THE ENGINEERING SOCIETY.

This Society was organized in 1873 and admits by election students in the Junior and the Senior Classes. Its meetings are held monthly.

FOUNDER'S DAY.

On the second Thursday of October of each year Commemorative Exercises are held in honor of the Founder of the University.

On Thursday, October 11th, 1883, the fifth celebration of Founder's Day occurred. In the Opera House, a service appropriate to the occasion was held and a Memorial Address was delivered by the Hon. Eckley B. Coxe, of Pennsylvania.

WASHINGTON'S BIRTHDAY.

This day is observed as a holiday and is usually celebrated by the students in an appropriate manner.

On Thursday, February 22d, 1883, exercises were held in the chapel. Washington's farewell address was read by Mr. Hofford, and orations were delivered by Messrs. Cooke, Douglas, Hillegass, Merkle, Smith and Watson, of the Junior Class, and there was vocal music by the University Glee Club.

THE UNIVERSITY SERMON.

This sermon is preached on the Sunday before University Day.

The Rev. Charles C. Tiffany, D.D., of New York, was the preacher on Sunday, June 17th, 1883, in the University Chapel.

THESES.

Theses on the following subjects were prepared by the graduating class of 1883:

"A Comparison of the Costs of Hauling Coal up grades by Locomotives and up planes by Stationary Engines, with a Review of the Ashley Planes."

Enos Kellar Bachman.

"The Origin and Growth of the English Drama."

Walter Briggs.

"The Origin of Language."

Harry Augustus Butler.

"A Resumé of the Principles Regulating the Conduct of International Negotiation."

Hedley Vicars Cooke.

"The Origin and Development of the Laws and Customs of English Nations."

Francis Joseph Crilly.

"Comparison of the Cost of Short Span Railroad Bridges and Culverts."

Francis Wharton Dalrymple.

"On the Elimination of Sulphur in the Puddling Process."

Timothy James Donahoe.

"An Inquiry into the adaptability to Coal Mining of Power Drilling and Electric Firing."

George Francis Duck.

"Gas Engines."

Alfred Edmond Forstall.

"Report of the Testing of a Steam Boiler and Engine."

NATHANIEL OLIVER GOLDSMITH.

"Review of the Coal Stocking Yards at Perth Amboy, New Jersey."

WILLIAM THEODORE GOODNOW.

"The Origin of the Jury."

JOHN DANIEL HOFFMAN.

"On Mine Surveying."

GEORGE GOWEN HOOD.

"Design for a New Bridge over the Lehigh River at Bethlehem."

GARRETT LINDERMAN HOPPES.

"Design for a Steel Bridge of 150 feet Span."

JULIAN DE BRUYN KOPS, B.E.

"The Statesmanship of Pericles."

PRESTON ALBERT LAMBERT.

"Condensers."

EDWIN FRANCIS MILLER.

"Ethical Systems and the Supreme Good of Man."

WILSON FRANKLIN MORE.

"An Examination of a Porter Governor."

NELSON MORROW.

"Examination of a Westinghouse Engine."

THOMAS NICHOLSON, JR.

"The Endless Rope System of Underground Haulage applied to the Mining of Anthracite Coal."

GEORGE SPENCER PATTERSON.

"The Relation between Great Britain and the United States during the Rebellion."

RICHARD REMBRANDT PEALE.

"Accidents in Mines: their Causes and Methods of Prevention."

HENRY ALLEBACH PORTERFIELD.

"Plan of a Sewerage System for South Bethlehem, Penna."

FRANCIS HENRY PURNELL.

"Review of the Hudson River Tunnel."

JESSE WILFRED RENO.

"Error in the Indicator Card due to Variable Velocity Ratio of Pencil to Piston."

CHARLES LOOMIS ROGERS.

"Comparison of the Ordinary Link Motion with the Joy Valve Gear."

JOHN RUDDLE.

"A Summary of the Laws Governing Nations in a State of War."

CHARLES HENRY STINSON.

"The Dark Continent."

ROBERT STINSON.

THE ADDRESS BEFORE THE ALUMNI

was delivered on the evening of Alumni Day, June 20th, 1883, in the large Drawing Room of Packer Hall, by Dr. Thomas M. Drown, of Easton, Pa.

UNIVERSITY DAY.

This day is the last of the academic year and falls in 1884 on the third Thursday in June. On this day orations are delivered by members of the Graduating Class, and Degrees are conferred.

EXERCISES ON JUNE 21st, 1883:

Reading of Scripture and Prayer by the Rt. Rev. M. A. DeWolfe Howe, D.D., LL.D., Bishop of the Diocese.

Oration, with the Salutatory Addresses—"Individuality."

PRESTON ALBERT LAMBERT.

Oration—"Rienzi."

HEDLEY VICARS COOKE.

Oration—"More Light."

FRANCIS WHARTON DALRYMPLE.

Oration—"Monopolies."

NATHANIEL OLIVER GOLDSMITH.

Oration—"The Era of Universal Peace."

WILSON FRANKLIN MORE.

Oration—"Parallel Education."

CHARLES LOOMIS ROGERS.

Oration, with the Valedictory Addresses—"The Value of Learning."

ALFRED EDMOND FORSTALL.

Award of the Wilbur Scholarship to

WILLIAM HARVEY COOKE,

of Bethlehem, first in rank in the Sophomore Class.

The following Degrees were conferred:

B. A.

Walter Briggs,
Hedley Vicars Cooke,
Francis Joseph Crilly,
John Daniel Hoffman,
Preston Albert Lambert,
Wilson Franklin More.

B. S.

Harry Augustus Butler,
Richard Rembrandt Peale,
Charles Henry Stinson,
Robert Stinson.

C. E.

Francis Wharton Dalrymple,
William Theodore Goodnow,
George Gowen Hood,
Garrett Linderman Hoppes,
Julian de Bruyn Kops, B.E.,
Francis Henry Purnell.

M. E.

Alfred Edmond Forstall,
Nathaniel Oliver Goldsmith,
Edwin Francis Miller,
Nelson Morrow,
Thomas Nicholson, Jr.,
Charles Loomis Rogers,
John Ruddle.

E. M.

Enos Kellar Bachman,
George Francis Duck,
George Spencer Patterson,
Henry Allebach Porterfield,
Jesse Wilford Reno.

A. C.

Timothy James Donahoe.

The Benediction was then pronounced by the Bishop.

The music upon University Day was by Hassler's Orchestra.

THE WILBUR SCHOLARSHIP.

This Scholarship was founded in 1872 by E. P. Wilbur, Esq., of South Bethlehem, and is the sum of $200, awarded annually to the student in the Sophomore Class having the best record.

ALUMNI PRIZES FOR ORATORY.

The "Alumni Association of the Lehigh University" has established an Annual Award of Fifty Dollars, as Prizes for excellence in Oratory, subject to the following

REGULATIONS.

1. There shall be a FIRST PRIZE of *Thirty Dollars*, and a SECOND PRIZE of *Twenty Dollars.*

2. To entitle one to be a competitor, his standing during the First Term of the Junior Year in Essays and Original Orations shall be at least 8.

3. The Executive Committee of the Alumni Association, or a committee of not fewer than three to be appointed by them, shall hear all competitors qualified to appear and the awards shall be made by a majority of these Judges.

4. The Orations shall be original and shall not exceed ten minutes in length, and shall be presented for examination to the Professor of Rhetoric at least fifteen days before the contest.

5. In awarding the Prizes, the Judges shall consider the literary merits and the delivery of each Oration, but shall give greater weight to excellence in Elocution.

At the last contest, the First Prize was awarded to

AUGUSTUS PARKER SMITH,

and the Second, to

HARRY HURD HILLEGASS.

The next contest will take place February 22d, 1884.

ALUMNI ASSOCIATION
OF
THE LEHIGH UNIVERSITY.

OFFICERS.

1883-84.

PRESIDENT:

H. F. J. Porter, Trenton, N. J.

VICE PRESIDENTS:

R. B. Claxton, Philadelphia, Pa.
A. E. Meaker, Bethlehem, Pa.

SECRETARY AND TREASURER:

H. S. Houskeeper, South Bethlehem, Pa.

ALUMNI TRUSTEES:

Richard Brodhead, New York City.
(Term expires June, 1884.)
W. H. Baker, Philadelphia, Pa.
(Term expires June, 1885.)
Chas. L. Taylor, Pittsburg, Pa.
(Term expires June, 1886.)
Wm. R. Butler, Mauch Chunk, Pa.
(Term expires June, 1887.)

EXECUTIVE COMMITTEE:

H. F. J. Porter, *Chairman*,
H. S. Houskeeper, Wm. R. Butler,
Richard Brodhead, W. H. Baker,
Chas. L. Taylor.

MEMBERS.

CLASS OF 1869.

J. H. H. Corbin, A.C., Chemist, Alamosa, Col.

Charles E. Ronaldson, M.E., Mechanical Engineer, Siemen's Regenerative Gas Furnace, 119 South Fourth Street, Philadelphia.

Miles Rock, C.E., Astronomer, U. S. Naval Observatory, 1432 Chapin Street, College Hill, Washington, D. C.

CLASS OF 1870.

* L. Preston Ashmead, A.C., M.D.

R. Brodhead, M.E., Attorney-at-Law, 115 Broadway, N. Y.

William R. Butler, M.E., Secretary and Treasurer, Lehigh Stove and Manufacturing Co., Lehighton, Pa.

George A. Jenkins, A.C., Bethlehem Iron Co., Bethlehem, Pa.

William J. Kerr, A.C., 2037 Mount Vernon Street, Philadelphia.

Harry E. Packer, A.C., President Lehigh Valley Railroad, Mauch Chunk, Pa.

Harry R. Price, C.E., Mining Engineer, Pottsville, Pa.

Henry B. Reed, B.A., M.D., Practicing Physician, 2300 Delancy Place, Philadelphia.

William D. Ronaldson, B.A., M.D., Practicing Physician, Longdale, Allegheny Co., Va.

John M. Thome, C.E., Ph.D., Astronomer, National Argentine Observatory, Cordova, Argentine Republic.

* Russell B. Yates, C.E.

CLASS OF 1871.

J. N. Barr, M.E., Mechanical Engineer, Chicago, Milwaukee & St. Paul R. R. Co., Milwaukee, Wis.

Frank L. Clerc, C.E., Chemist, Jolpin, Mo.

H. S. Drinker, E.M., Attorney-at-Law, 218 South Fourth Street, Philadelphia.

Edward F. Fassett, A.C., 1530 Walnut Street, Philadelphia.

W. H. McCarthy, B.A., New Haven, Conn.

Waldron Shapleigh, A.C.

* C. G. Weaver, C.E.

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* Deceased.

CLASS OF 1872.

George P. Bland, C.E., Gibson & Bland, Engineers and Contractors, 119 South Fourth Street, Philadelphia.

D. P. Bruner, C.E., Attorney-at-Law, Harrisburg, Pa.

Henry St. L. Coppée, C.E., U. S. Ass't Engineer, Vicksburg Harbor, Vicksburg, Miss.

F. R. C. Degenhart, A.C., Chemist, Havemeyer's Sugar Refinery, 112 Wall Street, New York City.

Harvey S. Houskeeper, B.A., South Bethlehem, Pa.

L. E. Klotz, C.E., Robert Klotz & Son, Mauch Chunk, Pa.

O. M. Lance, A.C., Superintendent Plymouth Water and Gas Companies, Plymouth, Luzerne Co., Pa.

James S. Polhemus, C.E., U. S. Ass't Engineer, Harbor Improvements, Newport, Benton Co., Oregon.

Hon. Henry D. Scudder, C.E., City Engineer, and Real Estate and Fire Insurance, Trenton, N. J.

R. Floresta de Miranda, C.E., Division Engineer, San Francisco Railroad, Province of Bahia, Brazil.

CLASS OF 1873.

W. H. Baker, A.C., M.D., Practicing Physician, 1610 Summer Street, Philadelphia.

R. B. Claxton, C.E., Claxton & Co., 930 Market Street, Philadelphia.

J. P. S. Lawrence, M.E., Assistant Engineer, U. S. Navy, Bureau of Navigation, Navy Dep't, Washington, D. C.

W. M. Scudder, M.E., Attorney-at-Law, 772 Broad Street, Newark, N. J.

H. B. de Miranda, A.C., Professor of English, College of Para, Para, Brazil.

CLASS OF 1874.

C. W. Haines, C.E., Mexican National Construction Company, Colimia, Mexico.

W. D. Hartshorne, C.E., Superintendent Arlington Mills, Lawrence, Mass.

Allen A. Herr, C.E., Civil Engineer and Real Estate Agent, Lancaster, Pa.

Thomas Merritt, C.E., Battle, Merritt & Co., Contractors, 17 Adelaide Street, East Toronto, Ont., Canada.

W. M. Rees, C.E., Engineer Corps, Government Improvement of Mississippi River, Memphis, Tenn.

CLASS OF 1875.

Charles J. Bechdolt, C.E., Supervisor, Monongahela Division P. R. R. Monongahela, Pa.

Antonio M. Cañadas, A.C., Chemist, Loja, Ecuador.

John F. Halbach, B.A., B.M., Music Teacher and Dealer in Music, Lehighton, Pa.

W. A. Lathrop, C.E., Sup't and Engineer, Southwest Virginia Improvement Co., Coal and Coke Department, Pocahontas, Tazewell Co., Va.

A. E. Meaker, C.E., Instructor in Mathematics, Lehigh University, Bethlehem, Pa.

Joseph Morrison, C.E., Teacher, Glendon, Northampton Co., Pa.

Francis S. Pecke, C.E., Engineer N. Y. W. S. & B. Railway, Clyde, Wayne Co., N. Y.

E. H. Williams, A.B., (Yale) A.C., E.M., Prof. of Mining and Geology, Lehigh University, Bethlehem, Pa.

* C. F. Zogbaum, C.E.

CLASS OF 1876.

F. C. Angle, C.E., Attorney-at-Law, Danville, Pa.

J. D. Carson, C.E., General Manager Union Depot Co., Kansas City.

T. W. Frederick, M.E., Master Mechanic of the Buffalo Division N. Y. W. S. & B. R. R., Buffalo, N. Y.

William Griffith, C.E., Ass't Geologist, Anthracite District, Sec. Geological Survey of Pa., Pottsville, Pa.

C. W. Macfarlane, C.E., Supt. Foundry, William Sellers & Co., Sixteenth and Hamilton Streets, Philadelphia.

R.W. Mahon, C.E., Ph.D., Adjunct Prof. of Chemistry and Metallurgy, Lafayette College, Easton, Pa.

J. J. de Malcher, M.E., Naval Officer, Custom House, Para, Brazil.

W. P. Rice, C.E., Assistant to U. S. Engineer, Cleveland, Ohio.

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* Deceased.

Henry Richards, E.M., Mining Engineer, Tebo Mine, Dover, N. J.
L. W. Richards, M.E., Vulcan Iron Co., St. Louis, Mo.
Charles L. Taylor, E.M., General Superintendent Pittsburgh Bessemer Steel Co., (Limited), Pittsburgh, Pa.

CLASS OF 1877.

John Eagley, C.E., North Springfield, Erie Co., Pa.
Percival G. Geiss, C.E , Bethlehem, Pa.
Andrew M. Glassel, C.E., Bowling Green, Va.
George M. Heller, C.E., 853 North 20th Street, Philadelphia.
Henry S. Jacoby, C.E., Draughtsman U. S. Engineers' Office, Memphis, Tenn.
James S. Marsteller, C.E., Chief Engineer for Bethlehem Iron Co., Santiago de Cuba.
Seizo Miyahara, C.E., Kagoshima, Japan.
Charles R. Rauch, A.C., Bonanzo, Saguache Co., Colorado.
Lewis T. Wolle, C.E., Flour and Feed Mills, Akron, Ohio.

CLASS OF 1878.

Charles Bull, M.E., Assistant Superintendent, Hamlet Mills, Woonsocket, R. I.
James E. Gilbert, C.E., C. M. & St. P. Railway, Luzerne, Benton Co., Iowa.
William S. Hazlett, M.E., Architect, Zanesville, Ohio.
Frank P. Howe, A.B., (Brown) E.M., General Supt. Montour Iron & Steel Co., Danville, Pa.
Nathaniel Lafon, Jr., M.E., Ohio Falls Car Co., Jeffersonville, Ind.
Benjamin B. Nostrand, Jr., M.E., U. S. Electric Lighting Co., 59 Liberty Street, N. Y.
Milnor P. Paret, C.E., Engineer's Office, James River Improvement, Richmond, Va.
H. F. J. Porter, M.E., New Jersey Steel & Iron Co., Trenton, N. J.
William K. Randolph, C.E., Mexican National Construction Co., Jajalpas, Mex.
Robert H. Reed, B.A., Patent Office, Washington, D. C.
Henry C. Wilson, C.E., Chief Clerk and Consulting Engineer, U. S. Engineer's Office, Memphis, Tenn.

CLASS OF 1879.

J. S. Cunningham, M.E., Mining Engineer, Everett Iron Co., Everett, Penna.

J. H. Paddock, M.E., Div. Engineer, Pittsburg, McKeesport and Youghioghany, R. R., McKeesport, Pa.

F. W. Sargent, C.E., Ass't Engineer Mexican National Construction Co., Satillo, Mexico.

R. H. Tucker, C.E., Instructor in Mathematics and Astronomy, Lehigh University, Bethlehem, Pa.

CLASS OF 1880.

Abram Bruner, E.M., P. & W. R. R., Pittsburg, Pa.

Murray Morris Duncan, A.C., E.M., Roane Iron Company, Chattanooga, Tenn.

Thomas Hughlett Hardcastle, B.A., (M.A., '82) LL.B., Attorney-at-Law, Easton, Md.

John Tinsley Jeter, E.M., Mining Engineer, L. V. Coal Co., Wilkes-Barre, Pa.

Charles Francis King, A.C., Chemist Penn. Steel Co., Steelton, Pa.

George Earnest Potter, C.E., Div. Engineer M. & O. Ry., Hanover, Mich.

Fred. Putnam Spalding, C.E., U. S. Engineer's Office, Memphis, Tenn.

Leonard Blakslee Treharn, B.A., Tutor in Mathematics, 13 Tremont Street, Boston, Mass.

Benjamin Russell Van Kirk, M.E., Draftsman, Baldwin Locomotive Works, Philadelphia, Pa.

Frederick Copeland Wooten, M.E., Ass't Road Foreman Engineer, Pittsburgh Div. P. R. R., Derry Station, Pa.

CLASS OF 1881.

William Simon Cranz, A.C., Analytical Chemist, Darwin Mine, *via* Tuboc, Arizona.

Alexander Patrick Crilly, B.A., Attorney-at-Law, and City Solicitor, 540 Hamilton Street, Allentown, Pa.

Thomas Morgan Eynon, Jr., M.E., American Ship Building Co., Port Richmond, Philadelphia, Pa.

Charles Weed Gray, A.C., New York City.

Benjamin Franklin Haldeman, E.M., Cambria Iron Co., Johnstown, Pa.

Lewis Stockton, B.A., Student-at-Law with Bissel, Sicard and Goodyear, Attorneys-at-Law, Buffalo, N. Y.

CLASS OF 1882.

Charles Comstock Hopkins, B.S., Lehigh University, South Bethlehem, Pa.

Elmer Henry Lawall, C.E., Mining Engineer, Beaver Brook Collieries, Audenried, Pa.

Robert Thomas Morrow, Jr., C.E., Assistant Supervisor, Phila. & Erie Div. of Penn. R. R., Lewisburg, Pa.

Samuel Brenton Sickler, C.E., Engineer Corps, L. V. R. R., Tunkhannock, Pa.

Martin Wittmer, E.M., Wittmer & Emmerich, Assayers and Surveyors, Saguache, Colorado.

Eugene Ricksecker, C.E., U. S. Geological Survey, Washington, D. C.

Louis Oscar Emmerich, E.M., Wittmer & Emmerich, Assayers and Surveyors, Saguache, Colorado.

John Dougherty Ruff, E.M., Juragua Iron Co., Santiago de Cuba, Cuba.

CLASS OF 1883.

Enos Kellar Bachman, E.M., Lehigh University.

Walter Briggs, B.A., Teacher of Mathematics, Diocesan School, Reading, Pa.

Harry Augustus Butler, B.S., Bookkeeper, First National Bank, Mauch Chunk, Pa.

Hedley Vicars Cooke, B.A., Office of the Supt. of the L. V. R. R. Co., Bethlehem, Pa.

Francis Joseph Crilly, B.A., Principal of Schools, South Bethlehem, Pa.

Francis Wharton Dalrymple, C.E., Engineer Corps, Drinker, Lackawanna Co., Pa.

Timothy James Donahoe, A.C., Bethlehem Iron Co., South Bethlehem, Pa.

George Francis Duck, E.M., Lehigh University.

Alfred Edmund Forstall, M.E., Lehigh University.

Nathaniel Oliver Goldsmith, M.E., Weir Switch Co., Cincinnati, O.
William Theodore Goodnow, Bethlehem, Pa.
John Daniel Hoffman, B.A., Law Student, Bethlehem, Pa.
George Gowen Hood, C.E., P. & R. R. R. Engineer Corps, 413 Walnut Street, Philadelphia, Pa.
Garrett Linderman Hoppes, C.E., Bethlehem, Pa.
Julian de Bruyn Kops, B.E., C.E., Savannah, Ga.
Preston Albert Lambert, B.A., Instructor in High School, Washington, D. C.
Edwin Francis Miller, M.E., Baldwin Locomotive Works, Philadelphia, Pa.
Wilson Franklin More, B.A., Lancaster, Pa.
Nelson Morrow, M.E., Penna. R. R. Shops, Renovo, Pa.
Thomas Nicholson, Jr., M.E., Jenkintown, Pa.
George Spencer Patterson, E.M., Lehigh University.
Richard Rembrandt Peale, B.S., Law Student, Philadelphia, Pa.
Henry Allebach Porterfield, E.M., Lehigh University.
Francis Henry Purnell, C.E., Lehigh University.
Jesse Wilford Reno, E.M., Lehigh University.
Charles Loomis Rogers, M.E., Engineer of Lloyd Valve Co., Bethlehem, Pa.
John Ruddle, M.E., Inspector Trust & Safe Deposit Co., Philadelphia, Pa.
Charles Henry Stinson, B.S., Law Student, Norristown, Pa.
Robert Stinson, B.S., Law Student, Norristown, Pa.

ASSOCIATE MEMBERS.

Charles W. Roepper, '69, Chemist, Supt. Steel Department, Springfield, Ill.
Samuel P. Sadtler, Ph.D., F.C.S., Professor of General and Organic Chemistry, University of Pennsylvania, Philadelphia, Pa.
Milton Dimmick, '70, Philadelphia, Pa.
E. Warren Sturdevant, '75, Attorney-at-Law, Wilkes-Barre, Pa.

The number of Graduates is 138, of whom there are 16 who have taken the Degree of B.A.; 5 of B.S.; 57 of C.E.; 26 of M.E.; 13 of E.M.; 17 of A.C.; and 2 who have taken the two degrees of A.C. and E.M.

LIST OF DONATIONS
TO THE
VARIOUS DEPARTMENTS
FOR
THE LEHIGH UNIVERSITY.

DONATIONS TO THE LIBRARY.

From Hon. A. J. Herr, Harrisburg, Pa.

Pennsylvania Legislative Directory. 1883.
Smull's Legislative Handbook. 1883.

From Prof. Geo. H. Cook, New Brunswick, N. J.

Annual Report of the State Geologist, N. J., for 1882. G. H. Cook.

From Prof. Selden J. Coffin, Easton, Pa.

Semi-Centennial Commencement Lafayette College. 1882.

From Willard Bartlett, New York.

Treatise on Calculus of Variations. 1881. L. B. Carll.

From Edward J. Koons, Minersville, Pa.

Postill. Kurtze Auslegung über die Evangeliem, by John Wörner. 1558.

From Hon. E. E. Higbee, Superintendent Public Schools, Pa.

Report of Superintendent of Public Schools. 1882.

From American Institute of Mining Engineers.

Transactions. Vol. 10.

From Seismological Society of Japan.

Transactions. Vol. 4 and 5. 1882.

From American Association for the Advancement of Science.

Fossil Butterflies, by Scudder.

From Massachusetts State Library.

Catalogue of the Library. 1880.
First Annual Supplement to General Catalogue.
Third Annual Supplement to General Catalogue.

From Boston Public Library, Mass.

Bulletin of Vol. 4, Nos. 10, 12.
Bulletin of Vol. 5, Nos. 1, 2, 5, 6, 7.
Twenty-Ninth Annual Report. 1881.
Thirtieth Annual Report. 1882.

From Trustees New Bedford Public Library, Mass.

Thirtieth Annual Report.

From Hon. F. Jordan, Secretary of Commonwealth Penna.

Thirteen Executive Documents.
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